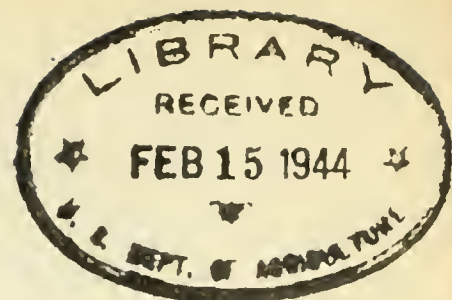


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UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF AGRICULTURAL ECONOMICS



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Agricultural Economics Bibliography No. 26

LABOR REQUIREMENTS OF FARM PRODUCTS

In the United States

A List of References to Material Published
since 1922.

Compiled by Louise O. Bercaw,
Under the Direction of Mary G. Lacy,
Librarian, Bureau of Agricultural Economics

Washington, D. C.
April, 1929.

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This bibliography consists of references to publications (State and Federal, principally) which give the actual number of hours of labor required to produce individual crops and livestock in the United States. Data on labor required per farm have not been included unless specific products are mentioned. Cost of production studies which give costs but not quantity of labor required have not been included. For earlier references see "References on Labor Distribution" by Cora L. Feldkamp, a 7-page mimeographed list issued by the Office of Farm Management, U. S. Department of Agriculture, Feb. 10, 1920.

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1. Adams, R. L. Cost of producing almonds in California; a progress report. Berkeley, 1927. 52 p. (Calif. Agr. exp. sta. Bul. 422)
Among the items comprising costs as given in this bulletin is soil work. Pages 14-18 deal with man labor, use of horses, use of tractors, use of implements, and irrigation in soil work.
2. Adams, R. L. The cost of producing market milk and butterfat on 246 California dairies. Berkeley, 1923. 164 p. (Calif. Agr. exp. sta. Bul. 372)
"The manner of assembling the data and other details are described in part 1. Part 2 sets forth the actual costs incurred in the production of whole milk or butterfat, presenting the returns for each district individually... Certain of the unit factors involved, or the basic items making up the complete cost measured in terms of time and quantity wherever possible rather than in dollars and cents, are presented in part 3. These show the amount of labor, feed, hauling, supplies, interest on operating capital, and charges for herd, buildings, corrals, and equipment reported in quantity, dollars and percentages for a stated amount of product... In part 4 are suggested certain ways of increasing the profits from dairying operations." -Experiment Station Record, v.51, p.488.
Tables 26-28, p.143-145, give the unit factors (including manual labor and horse labor hours) involved in the production of 1000 pounds of whole milk, for individual districts in California.
3. Adams, R. L. Cost of work horses on California farms. Berkeley, 1926. 20p. (Calif. Agr. exp. sta. Bul. 401)
The data in this bulletin are from the records of 187 California farms. Records are based on the calendar year 1922.
Table 5, p.9: Time spent in chores per horse per day for the dairy and field crops group, and for the orchard and vineyard group.
Table 19, p.13: Unit factors involved in the cost of keeping work horses, per animal, per year.

4. Adams, R. L. The results of a survey to determine the cost of producing beef in California. Berkeley, 1924. 22 p. (Calif. Agr. exp. sta. Circ. 281)

Man and horse labor and other data are given in tables showing unit factors per head involved in raising beef cattle.

5. Allred, C. E., and Atkins, S. W. An economic analysis of farming in Overton County, Tennessee. Knoxville, 1927. 127p. Mimeographed. (Tenn. Agr. exp. sta. Agricultural economics survey no.1) 100 T25A

"Mimeographed by the Department of Agricultural Education, University of Tennessee, in cooperation with the State Board for Vocational Education."

Utilization of labor: p.88-95. Table 48, p.89, shows approximate work units [man labor and horse labor hours] needed for various farm enterprises - corn (shocked and put in crib, husked from stalk, hogged down, silage); wheat and oats (thrashed); rye (pastured or turned under); hay; cowpeas and soybeans; apples; gardens; milk cow; beef cattle; horses; sheep; swine; and poultry.

6. App, Frank. Farm economics, management and distribution. 2d ed., rev. Philadelphia, Chicago & London, J. B. Lippincott company, 1928. 700p. (Lippincott's Farm Manuals) 281 Ap4

Farm labor: p.647-672.

Cost of producing farm products: p.486-507. On p.493 and 494 there are charts which show cost of producing corn and regional variations in labor requirements for producing corn in a number of states; and regional variations in cost factors in five spring wheat areas and nine winter wheat areas, 1919.

7. Ball, C. R., and others. Oats, barley, rye, rice, grain sorghums, seed flax & buckwheat. Washington, 1923. (In U. S. Dept. agr. Yearbook, 1922, p.469-568)

Labor (man and horse) required for producing grain sorghums in Texas and Kansas: p.557-558. Man labor requirements for oats and flax in Minnesota and North Dakota; p.558.

Man and horse labor required for buckwheat in Pennsylvania and New York: p.559.

8. Benedict, R. and Worsham, C. G. A handbook of South Dakota farm production costs and crop statistics. Pierre, 1924. 75p. (S. Dak. Dept. agr. Circ. 8) 2 So84C

The first 7 circulars issued by this Department contain statistics very similar to this one.

In the cost of production tables data on man labor and horse work hours are included. Commodities are wheat, corn, oats, barley, potatoes, flax, rye, wild hay, alfalfa, 100 pounds of pork, butterfat, poultry and eggs, and corn-fed cattle.

9. Bennett, M. K. Farm cost studies in the United States; their development, applications, and limitations. Stanford university, Calif., Food research institute [1928], 289p. (Food research institute. Miscellaneous publications 4) 389.9 F73

Bibliographical notes at end of some chapters.

"Broadly stated, the purpose of the present study is to describe and evaluate the work which has been and is being done in the United States in the collection and analysis of statistics of farm costs of production." -Foreword.

Labor requirements are discussed on p.134-141, 172-173.

10. Bonnen, C. A. Preliminary report of the cost of producing farm products on 20 farms in Brown County, 1925. Brookings [1926] 22p. Mimeographed. 281 So8

Department of Farm Economics, South Dakota State College of Agriculture and Mechanic Arts, in cooperation with the Bureau of Agricultural Economics, U. S. Dept. of Agriculture.

Costs and hours of man labor and horse work and tractor work are given in the cost data for wheat, oats, barley, husked corn, corn harvested by livestock, bundle corn, hullless oats, spelt, millet seed, alfalfa hay, sweet clover hay, sweet clover seed, millet hay, wild hay, and potatoes.

Man labor and horse work hours are also given for cows, cattle other than cows, mixed cattle, pork, poultry, and work horses.

11. Bonnen, C. A., and Hutson, J. B. Profitable farming systems for east central South Dakota. Brookings, 1927. 80p. (S. Dak. Agr. exp. sta. Bul. 226)

The Appendix, p.54-80, is devoted to tables giving "the labor and material requirements for crop and livestock production on each of the farms for 1923 and also the average from all farms for each year of the three year period. The amount of labor required to perform each crop operation and the number of times each operation was performed is also shown." Man labor and horse work requirements are given for seed bed preparations; fodder corn; corn husked; potatoes; oats; barley; alfalfa; timothy seed and mixed hay; sweet clover and wild hay; wheat, rye, flax and emmer; work horses; 100 pounds of pork; cows; chickens; and mixed cattle.

12. Bonnen, C. A., and Rogers, R. H. Profitable farming systems for the intensive wheat area in South Dakota. Brookings, 1928. (S. Dak. Agr. exp. sta. Bul. 235)

Table V, p.10, gives standard labor (man and horse) requirements per acre for seed bed preparations and for wheat, flax, oats, barley spelt, corn, and hay, and total.

Table VII, p.12, shows standard feed and labor (man and horse) requirements for work horses, dairy cows, dairy young stock, milk cows, mixed young stock, steers, swine, and poultry.

In tables giving suggested systems of farming for farms of different sizes, man and horse labor data are included in data given.

Detailed data are given in tables XVI-XXX, p.34-48.

13. Boyd, G. R. Clearing land of brush and stumps. Washington, 1927. 35p. (U. S. Dept. agr. Farmers' bul. 1526)

Work (man and horse hours) required per acre for brushing, piling and burning brush on burned and unburned land in Minnesota: table 1, p.7.

Comparative labor units (man and horse hours) per acre required in disposing of stumps in Minnesota: table 2, p.8.

14. Brandes, E. W. Sugar. Washington, 1924. (In U. S. Dept. agr. Agriculture yearbook, 1923, p.151-228)

Practices and labor requirements in growing and transporting sugar cane: p.164-177. Several tables show man and mule labor requirements for producing and harvesting sugar cane in Louisiana.

Cost of producing sugar beets: p.193-200. Data are taken from various Department Bulletins. Tables and charts are given which include man and horse labor hours required for sugar beets in certain sections of California, Utah and Idaho, Colorado, Michigan, and northwestern Ohio.

15. Brannen, C. O. Production costs and market distribution of Arkansas peaches. Fayetteville, 1926. 29p. (Ark. Agr. exp. sta. Bul. 207)

Labor and farm power: p.10-13. Tables 4 and 5, p. 11-12, show labor practices and cost of producing peaches, Ozark foothills and Highland, Arkansas. Man labor and horse and tractor work data are included. Tables 6 and 7, p. 15-18, show labor practices and cost of developing one acre of peach orchard to 4 years of age in the Ozark foothills, and in Highland, Arkansas.

16. Brannen, C. O., and Dickey, J. A. Strawberry production and marketing in Arkansas. Fayetteville, 1927. 27p. (Ark. Agr. exp. sta. Bul. 218)

Approximately nine pages are devoted to data on costs of producing and developing strawberries in Northwest Arkansas and the White County district of Arkansas. Hours of man work and horse work are included in the cost items.

17. Brierley, W. G., Koppen, W. J., and Pond, G. A. The cost of producing apples in Minnesota, 1916-1920. University Farm, St. Paul, 1924. 44p. (Minn. Agr. exp. sta. Bul. 209)

Labor requirements: p.26-34. Man and horse labor hours are given.

An article by Mr. Brierley summarizing this study is given in the Proceedings of the American Society for Horticultural Science, 1923, p. 9-12, and in Minnesota Horticulturist, v. 52, no. 8, Aug. 1923, p. 239-242. This includes a table giving a summary of acre and bushel costs and profits and man and horse hours required per acre in Minnesota apple orchards.

18. Brodell, A. P. Cost of producing Virginia dark and bright tobacco and incomes from farming, 1922-1925. Blacksburg, 1927. 45p. (Va. Agr. exp. sta. Bul. 255)

Labor requirements of tobacco farms: p.14-17. Charts on these pages show hours of man and horse labor by 10-day periods on a typical dark tobacco farm, 1922, for livestock, miscellaneous crops, clover, oats for hay, peas and beans, wheat, corn, dark tobacco, and total farm labor.

19. Brodell, A. P. Cost of producing Virginia dark fire-cured and bright tobacco, Charlotte and adjacent counties, crop year 1923. A preliminary report. Washington, D. C. June, 1924. 11p. Mineographed. 1.9 Ec75T

Virginia Agricultural College and Polytechnic Institute and U. S. Department of Agriculture, Bureau of Agricultural Economics cooperating.

Distribution of man and horse labor and motive power on Virginia dark fire-cured and bright tobacco farms acre basis, 1923 crop: table II, p. 5.

Variations in the amount of man and horse labor required in the different operations of producing tobacco crops of 1922 and 1923, acre basis: table IV, p. 9.

A similar report was issued for the 1922 crop.

20. Brodell, A. P. Cotton harvesting by newer methods saves much labor. (In U. S. Dept. agr. Yearbook of agriculture, 1927, p. 223-224)

"Requirements for picking an acre of cotton yielding 160 pounds of lint are estimated to amount to 40 or 50 per cent of the total labor required for producing cotton in western Texas and Oklahoma. Growers who harvested their crop by snapping instead of picking reduced their harvest labor requirements about 35 per cent as compared to a reduction of about 90 per cent when the sled was used. In the eastern Cotton Belt harvest labor requirements usually amount to from 30 to 40 per cent of the total labor required for producing an acre of cotton yielding 160 pounds. It is estimated that on the average about 120 hours of labor are required to pick sufficient seed cotton to make a bale of 500 pounds lint in the eastern belt as compared with 60 to 70 hours for picking, about 45 hours for snapping, and about 7 hours for sledding this quantity of cotton in western Texas and Oklahoma."

21. Brodell, A. P. Labor requirements measured for principal crops. (In U. S. Dept. agr. Yearbook of agriculture, 1926, p. 466-467)

Labor requirements for tobacco, cotton, potatoes, corn, wheat, and hay are discussed in this short article.

22. Brodell, A. P., and Cooper, M. R. Requirements and costs for picking, snapping and sledding cotton in western Texas and Oklahoma. A preliminary report. Washington, June, 1927. 7p. Mineographed. 1.9 Ec762Re

United States Department of Agriculture, Bureau of Agricultural Economics in cooperation with the Oklahoma Agricultural and Mechanical College and the Texas Agricultural and Mechanical College.

Labor requirements for harvesting cotton by different methods: p.4-5.

23. Brodell, A. P., and Washburn, R. S. Appendix of tables to The commercial peach industry in the United States. Part II (Cost of developing orchards and cost of producing peaches). Washington, D. C., August, 1926. 43 tables. Mineographed. 1.9 Ec7Cp

Issued by the United States Department of Agriculture, Bureau of Agricultural Economics, in cooperation with state and local agencies.

Tables consist of detailed data on labor practices and cost of developing one acre of peach orchard and cost of producing peaches in

certain districts of Georgia, South Carolina, North Carolina, Tennessee, Virginia, West Virginia, Pennsylvania, Maryland, New Jersey, New York, Texas, Arkansas, Illinois, Michigan, Colorado, and Utah. Man labor and horse and tractor work hours are included in the data.

24. Burdick, R. T. Preliminary report. Cattle feeding 1922-23 and 1923-24, Weld County, Colorado. [Fort Collins? 1925?] 12p. Mimeographed. 43 B889.

Department of Economics and Sociology, Colorado Agricultural Experiment Station cooperating with Bureau of Agricultural Economics, U. S. Dept. of Agriculture.

"This report includes five farms for 1922-23 and five farms for 1923-24."

Table VII, p. 8, gives man and horse labor requirements for feeding cattle for the two years.

25. Burdick, R. T., and Bigelow, Edna. Preliminary report. Sheep feeding 1922-23 and 1923-24, Weld County, Colorado. [Fort Collins, 1925?] 27pp. Mimeographed. 45 B89

Colorado Agricultural College, Dept. of Economics and Sociology and U. S. Dept. of Agriculture, Bureau of Agricultural Economics cooperating.

"Covers the feeding operations on nine farms that fed sheep during the winter of 1922-23 and on eleven farms that fed sheep in 1923-24."

Labor (man and horse) requirements in feeding sheep: p.22-23.

26. Burdick, R. T., Reinholt, Martin, and Klemmedson, G. S. Cattle-ranch organization in the mountains of Colorado. Fort Collins, 1928. 62p. (Colo. Agr. exp. sta. Bul. 342)

This is a companion bulletin to Colorado Agricultural Experiment Station Bulletin 327, A Study of Ranch Organization in Eastern Colorado, by the same authors.

Ranch labor: p. 42-44. Table 17 in this section shows the amount of ranch labor by years (1922-1925) including operator's and family labor.

27. Burdick, R. T., Reinholt, Martin, Klemmedson, G. S. A study of ranch organization in eastern Colorado. Fort Collins, 1928. 61p. (Colo. Agr. exp. sta. Bul. 327)

This bulletin gives the results of the study of 22 ranches during the period 1922-1925. The ranches ranged in size from 3.5 to 108 sections. Included in the 42 tables of statistical data are the following: Size of ranches, average for period studied (p.8); Amount of ranch labor by years, including operator's and family's labor (p.47); and number of cattle handled per man (p.48).

28. Campbell, C. E. An economic study of tomato production for canning in Arkansas. Fayetteville, 1928. 27p. (Ark. Agr. exp. sta. Bul. 225)
Labor requirements: p.15-19. Man labor and horse labor requirements to produce an acre of tomatoes are given for New Jersey, New York, Ohio, and Arkansas.
29. Case, H. C. M., and Ross, R. C. The place of hog production in Corn-belt farming. Urbana, 1927. p. 147-179. (Ill. Agr. exp. sta. Bul. 301)
On p. 161 there is a graph which shows the man labor required, monthly, for the hog enterprise on a 320-acre farm and total man labor used on the farm. "The graph is based on ten years of records (1913-1922) from a farm raising both spring and fall pigs."
Table 8, p. 162, gives man and horse hours for 100 pounds of pork produced, by size of enterprise, in Hancock County, 1913-1922. A graph on p. 167 also gives man and horse labor.
30. Collingwood, G. H., Cope, J. A., and Rasmussen, M. P. The production of maple sirup and sugar in New York state. Ithaca, 1928. 76p. (Cornell Univ. N. Y. State col. agr. Ext. serv. Ext. bul. 167)
Bibliography: p. 75-76.
Cost of producing maple sirup: p. 58-66. Hours of human labor in producing 100 gallons of sirup are given for both Vermont and New York farms.
31. Connecticut (Storrs). Agricultural experiment station. [Investigations in agricultural economics at the Connecticut Storrs station, 1926-27, Storrs, 1928. (In its Bul. 149, p. 325, 326).
"The average cost of producing a pound of tobacco in the towns of East Windsor and Ellington in 1925 was 23 cts., exclusive of rent for land. The units of work of productive labor per man employed varied from 100 to 350 on the different farms. Approximately 50 per cent of the farmers got from 175 to 275 units per man, 25 per cent below 175 units, and 25 per cent above 275 units." -Experiment Station Record, v. 59, p. 482.
32. Cooper, M. R. Cost of wheat production and incomes from farming in eastern Washington and northern Idaho for the years 1919, 1920, and 1921. Preliminary report. Washington, 1923. 37p. Mimeographed. 1.9 Ec75Wh
U. S. Dept. of Agriculture, Bureau of Agricultural Economics, Divisions of Cost of Production and Farm Management in cooperation with Idaho and Washington State Colleges of Agriculture.
Table 15, p. 37, shows average quantity factors of wheat and pea production for 1921. Direct man labor and horse labor per acre and seed and twine per acre are given.

33. Corbett, L. C. and others. Fruit and vegetable production. Washington, 1926. (In U. S. Dept. agr. Agriculture yearbook, 1925, p. 151-452)
"Economic influence of farm machinery [on the potato]. - Comparative studies of the relative man-labor hours involved in the production of farm crops by hand and machine methods illustrate in a very striking manner the economic value of farm machinery. According to Quaintance [Influence of farm machinery on production and labor. Am. Econ. Assoc., 5, No. 4, pp. 1-103, 1904] the man-labor hours required in 1866 to produce an acre of potatoes, yielding 220 bushels, averaged by the hand method 108.9 hours, while in 1895 the same crop was produced by machinery with an expenditure of 38 hours." -p. 360.
34. Corbett, R. B. Costs of packing fruit on farms. Ithaca, 1925. (In Cornell Univ. State Col. agr. Dept. of agricultural economics and farm management. Farm economics, no. 26, July 15, 1925, p. 318-320)
280.8 C812
Tables 2 and 4 show time and labor costs of the processes in packing a certain number of barrels of apples on an orchard in Monroe County, N. Y., in 1922. Other tables also give total number of hours of labor. Total number of hours spent in packing 77,092 bushels of peaches on 53 farms in one township in Niagara County, N. Y., in 1922, is also given.
35. Cornell university. College of agriculture, Dept. of agricultural economics and farm management. Economic studies of poultry farming in New York. I. Thirty-two farms on Long Island, year ended September 30, 1926. Preliminary report released May 7, 1927. For revision before publication. [Ithaca?], 1927. 75 p. Mimeographed. 47 [C]
In cooperation with the Division of Farm Management and Costs, Bureau of Agricultural Economics, U. S. Dept. of Agriculture. The authors are E. G. Misner, E. R. Johnson, and D. R. Marble.
For human and horse labor see p. 31-32. On p. 70, in items on labor efficiency, hours of labor per 100 fowls in laying flock and hours of labor per 1000 pullets raised are also given.
36. Dadisman, A. J. Organization and management of typical West Virginia farms. Morgantown, 1924. 75 p. (W. Va. Agr. exp. sta. Bul. 187)
"About 25 records were obtained by personal visits to farmers during the summers of 1915 and 1923 with respect to the total cost of producing corn, oats, wheat, buckwheat, and potatoes for the previous years in Preston and Brooks Counties. These are shown, and the distribution of man and horse labor on these crops in Preston County is presented graphically." -Experiment Station Record, v. 52, p. 589.
37. Dallas (Texas) morning news. Review of the 1926 "more cotton on fewer acres" contest and rules and prize list for 1927. A four-year program of agricultural development for Texas. Conducted by the Dallas Morning news, the Semi-weekly farm news in co-operation with the Agricultural and mechanical college of Texas. By Victor H. Schoffelnayer. [Dallas? 1927?] 29 p. 72.9 D16
"Table of work hours and yield per acre": p. 16-17.

38. Dowler, J. F. Livestock production costs in Greene County, Ohio. Wooster, 1928. 52 p. (Ohio Agr. exp. sta. Bul. 419)

"The cost data used in this study were taken from records collected from 25 different farms in the vicinity of Cedarville and Jamestown in Greene County, Ohio, during the five years 1920-1924...

"It is the aim... to set forth the comparative costs of production by the various methods in use on these farms for the several livestock enterprises, as a means of studying the weaknesses and strong points of such practices as are being used in livestock production today; and at the same time to give an idea of the relative magnitude of the different factors that enter into the cost of production of livestock; and to suggest methods to increase or decrease the volume of such factors for a more efficient production." -p. 3.

Table 8, p. 18, includes data on man labor and horse work hours necessary in the production of 100 pounds of marketable pork on 20 farms. Table 30, p. 46, shows variations in feed and man labor requirements per 100 chickens by farms. Man labor hours are given in table 31, p. 47, Average Annual Cost of Keeping 100 Chickens and Net Cost of Producing Meat and Eggs on 20 Farms. Hours of labor required are given in table 33, p. 49, Chickens; Some factors Related to the Cost of Egg and Meat Production by Farms.

39. Erwin, A. T., and Harter, W. L. The onion industry in Pleasant Valley, Iowa. Ames, 1925. p. 257-286. (Iowa Agr. exp. sta. Bul. 225)

Seasonal distribution of labor: p. 284-286. Table VIII, p. 285: Time (man and horse hours) required per acre grown from seed.

40. Esplin, A. C., and others. Sheep ranching in Utah. Report of a preliminary economic survey of the ranch situation as of 1925. Logan, 1928. 58 p. (Utah. Agr. exp. sta. Bul. 204)

Labor requirements: p. 33-35.

41. Ezekiel, Mordecai. Factors affecting farmers' earnings in southeastern Pennsylvania. Washington, 1926. 64 p. (U. S. Dept. agr. Dept. bul. 1400)

"Literature cited": p. 63.

"The study of farm organization and practice presented in this bulletin was undertaken, (1) to investigate the ways in which dairy farmers of the Piedmont Plateau region of the Atlantic coast were adapting their farm operations to the changed conditions following the World War period, and (2) to study the methods of organizing and operating their farms which make for greatest profits under these new conditions."

Table 20, p. 23: Average months of man-labor used on dairy farms, according to the area in crops and the number of dairy cows.

42. Ezekiel, Mordecai, and Vernon, J. J. Factors affecting returns from the dairy enterprise in the Shenandoah Valley. Preliminary report based on the conduct of the dairy enterprise on 188 farms in Rockingham and Augusta counties, Virginia. Washington, August, 1925. 17 p. Mimeographed. 1.9 Ec762Fa

U. S. Dept. of Agriculture, Bureau of Agricultural Economics, Division of Farm Management, and Virginia Agricultural Experiment Station, Division Agricultural Economics, cooperating.

Relation of cropping systems to value of crops and labor used: p. 15-16. Normal value of crops per acre and labor used per 100 crop acres for 2 different sized farms with silage and timothy, silage and clover, and silage and alfalfa as the major roughages produced are given in table 12.

43. Fain, J. R., and Tabor, Paul. Alfalfa for Georgia. Athens, 1926. 16 p. (Ga. State col. agr. Bul. v. 9, no. 4, June 1926. Revised bul. 217)
"Labor required for alfalfa growing": p. 15-16. Hours of man and mule labor per acre by operations are given for peavine, pea and sorghum, soybean, alfalfa, meadow, and Johnson grass hay.
44. Falconer, J. I. Labor requirements for corn production in 1907-1912 vs. 1920-1924. Wooster, 1927. (In Ohio. Agr. exp. sta. Bimonthly bul. v. 12, no. 1, (whole no. 124) Jan-Feb. 1927, p. 31)
Both man labor and horse labor are given.
45. Falconer, J. I., and Dowler, J. F. Variations in costs of producing corn, wheat, and other crops in Greene County, Ohio. Wooster, 1926. p. 233-284. (Ohio, Agr. exp. sta. Bul. 396)
"Tables are given showing for each farm the man, horse, and tractor labor used per acre, the expenditures for labor, manure and fertilizer, taxes, interest, seed, equipment, overhead, etc., the yields and the total costs per acre and per bushel of growing corn up to harvest and of growing and harvesting wheat and oats." - Experiment Station Record, v. 56, p. 82.
Standard labor requirements per acre are given.
46. Forster, G. W., and Saville, R. J. Profitable farm combinations [adapted to the lower coastal plain of North Carolina] Raleigh, 1927. 46 p. (N. C. Agr. exp. sta. Bul. 252)
Charts are given showing man labor and horse work distribution for livestock, oat hay, corn and soybeans, tobacco, soybean hay, rye pasture, peanuts, sweet potatoes, garden peas, oat and vetch hay, Irish potatoes, corn, and total crop and livestock work on standard farms of different sizes.
47. Forster, G. W., Saville, R. J., and Hutson, J. B. Profitable farm organizations for the coastal plain of North Carolina. Raleigh, 1926. 33p. (N. C. State col. agr. Bureau of economic and social research. Research bul.)
Man labor and horse work requirements for livestock, rye pasture, oats, corn and soybeans, tobacco, soybean hay, cotton, and total crop and livestock labor are given for farms of different sizes.

48. Funk, W. C. Costs and farm practices in producing potatoes on 461 farms in Minnesota, Wisconsin, Michigan, New York, and Maine for the crop year 1919. Washington, 1924. 40 p. (U. S. Dept. agr. Dept. bul. 1188)
Labor (man and horse) and material used per acre: p. 12. See also pages 16-33, for detailed tables showing cultural practices, range in man and horse hours per acre, etc.
49. Gabbard, L. P., and Jones, F. R. Large-scale cotton production in Texas. College Station, 1927. 24 p. (Tex. Agr. exp. sta. Bul. 362)
"This study was made in cooperation with the Bureau of Agricultural Economics and Public Roads U. S. D. A., to determine the influence of types of farm organization, power, and machinery, and the effect of different types of power and machinery on labor requirements for a large-scale production of cotton." -Experiment Station Record, v. 58, p. 79.
Man, horse, and tractor hours are given.
50. Garner, W. W., and others. History and status of tobacco culture. Washington, 1923. (In U. S. Dept. agr. Yearbook, 1922, p. 395-468)
Distribution of man and horse labor in growing Kentucky burley tobacco, 1919, Kentucky dark fire-cured tobacco, 1919, and Georgia bright flue-cured tobacco, 1920: p. 427-428.
51. Grimes, W. E., and others. Studies in the economics of beef production, Chase County, Kansas. Preliminary report covering two years work, grazing seasons of 1921 and 1922, winter seasons of 1921-22 and 1922-23. Manhattan, Kansas, July, 1923. 31 p. Mimeographed. Pan. Coll. Kansas Agricultural Experiment Station, Department of Agricultural Economics, in cooperation with Bureau of Agricultural Economics, U. S. Dept. of Agriculture.
Table I, p. 11 and 12, shows pasture and labor (man and horse labor hours) record on 15,740 head of grass cattle, grazing season 1921 and 1922, Chase County, Kansas.
52. Grimes, W. E., and others. A study of farm organization in central Kansas. Washington, 1925. 75 p. (U. S. Dept. agr. Dept. bul. 1296)
Labor and materials used in crop production: p. 11-41. Numerous tables are given showing man labor, horse work, and sometimes tractor work hours for the various operations in the production of wheat; oats; corn; alfalfa; and prairie grass, sowed sorghum and Sudan grass for hay.
Labor and materials used in livestock production: p. 42-53. Includes man and horse work hours for butterfat, mixed cattle, hogs, chickens, and work horses. There are other tables of interest, including labor hours for miscellaneous chores.
53. Gunn, R. V., and Jamison, W. C. Cost of producing milk and butterfat. Corvallis, 1924. 24 p. (Oreg. Agr. col. Ext. serv. Ext. bul. 371)
Contains a number of tables. Labor requirements per cow, per 100 pounds of milk, and per pound of butterfat are included in the data.

54. Hardenburg, E. V. Bean culture. New York, The Macmillan company, 1927. 238 p. 75 H21
Cost of production: p.46-49. This contains a table which gives a summary of average labor and material requirements to the acre of field beans on 166 farms in New York, Michigan, Wisconsin, California, Colorado, New Mexico, and Idaho. This summary is adapted from R. S. Washburn's study of Labor and Material Requirements in the Production of Commercial Field Beans, in the Journal of Farm Economics, v. 3, no. 3, July, 1921.
55. Hauter, L. H. Economics of crop production on the Elephant Butte irrigation project. State College, 1928. 48p. (N. M. Col. agr. and mechanic arts. Agr. ext. serv. Ext. circ. 97)
"This is one of five circulars being issued as a direct outgrowth of the Economic Conference held at State College, New Mexico, February 15 and 16 and at El Paso, Texas, February 18 and 19, 1927. It is part of a plan to assemble facts on agricultural production, markets and prices that should be helpful when looking ahead and making plans for the future. While the information presented in most of the circulars is confined largely to the Elephant Butte Irrigation project in New Mexico and Texas, many of the facts will be applicable to a considerably larger area." -p. 2.
Labor requirements: p.18-28. In addition to the text, charts are used to illustrate the number of man and horse hours per acre required in the production of cotton, alfalfa, corn, cabbage, cantaloupes, and tomatoes.
56. Hedges, Harold. A survey of the cattle industry in the Nebraska sand hills. Lincoln, 1926. 22p. (Nebr. Agr. exp. sta. Bul. 215)
The labor problem: p. 16-17. Table 6 gives labor cost per head of cattle, months of labor required for 100 head of cattle, and number of cattle cared for by one man in a year on 71 ranches, 15 best ranches, and 15 poorest ranches, Sand Hills area, 1924-1925.
57. Hester, E. D., and others. Some economic and social aspects of Philippine rice tenancies. (In Philippine Agriculturist, v. 12, no. 9, Feb. 1924, p. 367-444) 25 P542
"Literature cited": p. 408-410.
Tenants farm labor time: p. 386-388. Includes a comparison of seasonal distribution of labor in the Philippines with that of China and Japan.
Animal labor: p. 388-389.
58. Hill, E. B., Gunn, R. V., and Collier, G. W. A farm management study in the Michigan corn borer area. East Lansing, 1927. (In Mich. Agr. exp. sta. Quarterly bul. v. 10, no. 2, Nov. 1927, p. 41-45)
"The results are included of a study made in cooperation with the U. S. D. A. Bureau of Agricultural Economics on 250 farms in 4 typical sections in 4 counties in southeastern Michigan....
"The average amount of extra labor and power needed to prepare 10 acres of cornland for spring crops, including barn and lot clean-up,

in the 4 sections varied as follows: Man labor from 55.2 to 72.4 hours, horse work 33.1 to 51.9 hours, and tractor work from 2.3 to 7.9 hours. A table is given showing typical amounts of labor and power required to prepare corn land for crops, using different practices, under normal and control methods." -Experiment Station Record, v. 58, p. 488.

- 58a. Hitchcock, J. A. Economics of the farm manufacture of maple syrup and sugar. Burlington, 1928. (Vt. Agr. exp. sta. Bul. 285 and 286)
Comprises "an analysis of data relating to the cost of production of maple syrup and sugar, the proceeds from their sale, and the profit or loss from the maple enterprise on 457 Vermont farms in the spring of 1925."

See particularly pages 28-29, Bul. 285, Unit Costs and Requirements, which include cost and number of hours of man and horse labor for production of syrup in bulk. See also pages 65-73, Bul. 285.

59. Hitchcock, J. A. A study in Vermont dairy farming. Burlington, 1925. 48 p. (Vt. Agr. exp. sta. Bul. 250)

"The farm business analyses which form the basis of the accompanying tabulations were secured... from farmers resident in the towns of Randolph and Royalton, Vermont. The records cover the transactions of the two years extending from April 1, 1921, to March 31, 1923."

Table 40, p. 47, gives a schedule of man and horse work units for hay, small grains, grain for hay, corn husked from shock, silage corn, sweet corn, field beans, potatoes, truck crops, apples, berries, maple sugar, dairy cow, calves and heifers, bull, sow and pigs, hogs, one sheep, 100 hens, 200 chickens raised, and miscellaneous items.

60. Hodgson, R. W. Grower's responsibility - an analysis of the situation confronting the citrus industry. (In California Citrograph, v. 9, April, 1924, p. 212.)

Address delivered at Citrus Insitute, San Bernardino.

Table 17 shows the average cost per acre of different items in the development of citrus orchards - oranges, and lemons - in the interior zone. "As these figures are averages of nearly 100 different projects, they should be fairly reliable."

Table 18 gives the hours of labor that the owner might perform and the value of his labor. These figures refer "only to man labor and are based on the average experience of 75 growers who furnished daily reports to the writer from 1915 to 1918. ...This does not include picking or hauling of fruit, or fumigating labor."

61. Hooker, P. K. Studies in Vermont dairy farming. II. Enosburg, Franklin Co., area. Burlington, 1926. 45 p. (Vt. Agr. exp. sta. Bul. 256)

"The object of this study is the analysis in relation to their effect on profits of: 1. The factors entering into the cost of making dairy products. 2. The methods of disposing of the product."

Man and horse labor hours per cow are included in data in table 7, p. 12. Table 20, p. 22, is Size of Herd and Labor Efficiency. Labor costs and labor per unit of product (average number of hours of man labor required to produce 100 pounds of butterfat) are given on p. 32.

62. Hopkins, J. A., jr. An economic study of the cattle feeding enterprise in Iowa. Ames, 1927. 46 p. (Iowa. Agr. exp. sta. Bul. 242)

"This bulletin is a part of a larger and broader study which attempts to explain the economic forces and conditions which have caused the development of the present types of farming in Iowa, and their location under the particular conditions where they are found."

Size of herd and labor requirement; p. 25-27.

63. Hungerford, DeF., and Westbrook, E. C. Systems of farming for south Georgia. Athens, 1923. 32p. (Ga. State col. agr. Bul. v. 11, no. 13, Jan. 1923-whole no. 273)

Gives detailed data on man and mule labor requirements on South Georgia farms for cotton; corn, peanuts and velvet beans; oats; wheat; cowpeas after grain; hog grazing crops; home supplies; peanuts; total with peanuts for additional cash crop; watermelons; total with watermelons for additional cash crop; sweet potatoes; total with sweet potatoes for additional cash crop; sugar cane; total with sugar cane for additional cash crop; corn solid; cantaloupes; and bright tobacco.

64. Hunter, Byron, and Nuckols, S. B. An economic study of irrigated farming in Twin Falls County, Idaho. Washington, 1926, 75 p. (U. S. Dept. agr. Dept. bul. 1421)

Cultural practices and labor used per operation in producing wheat, alfalfa hay, sugar beets, potatoes, beans, red clover seed, and alsike clover seed, 1921, p. 53-57. Both labor and horse hours are given.

Labor and materials expended per acre in the production of the same crops, 1919, 1920, 1921: table 44, p. 58.

Three-year average hours of labor and quantities of materials used per acre in the production of the same crops, 1919-1921: table 63, p. 72.

65. Hutson, J. B. Strawberries and farm profits in western Kentucky. Lexington, 1924. p. 131-171. (Ky. Agr. exp. sta. Bul. 255)

"A detailed cost route was maintained in Christian County, Ky., cooperatively by the station and the Bureau of Agricultural Economics, U. S. D. A., from April, 1919, to April, 1924, and in connection with taking other data, information was obtained from 60 farms with reference to the labor [man labor and horse work] and material requirements for strawberries for the 3-year crop period." -Experiment Station Record, v. 53, p. 391.

66. Hutson, J. B., and Finn, W. G. Man labor, horse work and materials used in producing crops in Christian County, Lexington, 1926. p. 379-434. (Ky. Agr. exp. sta. Bul. 274)

Detailed data are given showing the amounts of man labor, horse work and materials used in producing tobacco, corn, wheat and hay in Christian County, Kentucky, during 1921, 1922 and 1923.

67. Illinois. Agricultural experiment station. A year's progress in solving some farm problems of Illinois. Thirty-eighth annual report...for year ended June 30, 1925. Urbana, 1926. 191p.

Tables 52-53, p. 111-112, are summaries of cost accounts on crops in Hancock and Franklin counties, 1913-1922. Man and horse labor, and sometimes tractor use, are given for corn, wheat, oats, clover, alfalfa, timothy, mixed hay, and rye for Hancock County. Rye is not given in the Franklin County data, but redtop, cowpeas, and soybean hay are given in addition to the crops named for Hancock County.

68. Illinois. Agricultural experiment station. A year's progress in solving some farm problems of Illinois. Annual report...thirty-ninth... June 30, 1926. Urbana, 1926. 184p.

"1925 acre costs of crops remain at 1924 level": p. 109-112.

There are two tables in this section which give detailed data on costs of producing crops and livestock and livestock products in Champaign and Piatt counties and in Knox and Warren Counties in 1925. Among the data given are man labor and horse labor, and sometimes tractor use, hours required in producing corn, oats, winter wheat, soybeans, soybean hay, clover, alfalfa, mixed hay, and timothy.

Man labor and horse labor hours required in producing 100 pounds of pork and 100 pounds of beef, maintaining milk cows, and maintaining 100 hens, are also given.

On p. 127-128 there is a short report on an investigation being made by R. I. Shawl relative to the use of mechanical power in the production of corn. The following is quoted: "The entire time required in 1926 to put in the 80 acres of corn was 207 tractor hours, or 2.59 hours an acre. This included double-disking the stalks, plowing, double-disking the ground, harrowing and rolling, and planting."

69. Illinois. Agricultural experiment station. A year's progress in solving some farm problems in Illinois. Annual report...fortieth...June 30, 1927. Urbana, 1927. 288p.

Farm management investigations, 1926/27 are reported on pages 165-195. Table 73, p. 184, gives three-year average cost of producing corn, oats, barley, spring wheat, winter wheat, timothy, mixed hay, clover, alfalfa, soybean hay, and oat hay, in Knox and Warren Counties 1923-1925. Included in data are hours and costs per acre of man and horse labor and sometimes tractor work. Table 74, p. 186, gives costs of producing corn, oats, wheat, soybeans thrashed, soybean hay, and timothy, on Champaign and Piatt county farms in 1926. Labor hours and costs are given.

Tables 75 and 76, p. 188-189, give horse labor costs on Champaign and Piatt county farms, 1920 to 1926, and for 1926. Data are given for labor chores- man and horse labor hours.

70. Illinois. University. College of agriculture. Department of farm organization and management. Cost of producing farm products on 18 farms in Knox and Warren counties, 1924. Prepared by H. C. M. Case and C. A. Bonnen. Urbana [1925?] 39 p. Mimeographed. 281 Il6C

This report is similar to the one issued in 1924 on Champaign and Piatt counties by the same authors. Man labor and sometimes tractor hours are given for husked corn; corn, hogged and cattled down; oats; winter wheat; soybean hay; spring wheat; barley; clover seed; clover hay; alfalfa hay; mixed hay; timothy hay; oats hay; horses; tractors; cattle; sheep; pork; and poultry products.

71. Illinois. University. College of agriculture. Department of farm organization and management. Cost of producing farm products on 14 farms in Champaign and Piatt counties, 1924. Prepared by H. C. M. Case and C. A. Bonnen. Urbana, [1924], 36 p. Mimeographed. 281 Il6

This publication consists mainly of statistical tables which show the cost of producing corn, oats, wheat, soybeans, clover hay, soybean hay, timothy hay, mixed hay, alfalfa hay, Champaign and Piatt counties, 1924; alfalfa hay, corn, wheat, oats, clover, timothy, mixed hay, and rye in Hancock County, 1913-22; alfalfa hay, Knox and Warren counties, 1924; horse and tractor labor costs, Champaign and Piatt counties, 1924; cost of producing cattle, beef, sheep, pork, poultry products, Champaign and Piatt counties; and miscellaneous costs. Amount and value of man and horse labor, and sometimes tractor use, are given for practically every one of these items.

72. Iowa county cost route, 1926. Reports, 5-6, 9-11. [n.p.] Mimeographed. Pam. Coll.

Report no. 5 is on the corn crop. Labor requirements in corn cultivation are given. Data include man, horse, and tractor hours for different farms.

Report no. 6 is on small grain crops. Man, horse, and tractor hours are given for oats, wheat, and barley.

Report no. 9 is "Expenses on horses and tractors." Tables IV-VIII show man, horse, and tractor hours used in plowing, discing, harrowing, drilling or sowing small grains, and cutting small grains.

Reports no. 10 and 11 are on equipment and labor.

73. Jensen, W. C. Economics of producing and marketing South Carolina peaches. Clemson College, 1927. 51 p. (S. C. Agr. exp. sta. Bul. 239)

"This study is part of a regional economic investigation of the peach industry of the United States undertaken cooperatively by the Federal Bureau of Agricultural Economics and the experiment stations of practically all the states which produce peaches commercially."-p.6.

For labor (man, and mule and tractor work) distribution see tables 3 and 5, p. 13 and 16, labor practices and expenditures in developing one acre of peaches to three years of age based on records of orchards in the McBee, and the Greenville, S. C., areas. Also see tables 9 and 10, p. 22-23; Annual practices in operating peach orchards in the McBee and the Greenville, S. C., areas, based on records of orchards in 1925.

74. Jensen, W. C. Farm organization and cost of production on cotton farms in Anderson County, S. C., in 1922. Clemson College, 1924. 101 p. (S. C. Agr. exp. sta. Bul. 221)

Labor: p. 73-79. Table 55, p. 76, shows man and mule labor hours per acre for cotton, corn, oats, wheat, and hay, on 20 farms in Anderson County, S. C., monthly in 1922. Quantity expenditures and other items of interest are also given in the sections devoted to individual crops.

75. Jensen, W. C. Farming for profits, Anderson and similar areas of South Carolina. Clemson College, 1926. 69 p. (S. C. Agr. exp. sta. Bul. 230)

Table 15, p. 46, gives, among other items, man hours, mule hours, machinery hours, and tractor and car hours per acre for sweet potatoes, Irish potatoes, sorghum syrup, melons, home orchard, home garden, green onions, green turnips, tomatoes, beans and cabbage, in the Greenville area, 1924. Tractor and car hours are not given for all crops. Tables 16-34 in the Appendix include also man hours, mule hours, and machinery use for the Anderson area for cotton, corn, oats, wheat, rye, cane hay, sorghum syrup, sweet potatoes, Irish potatoes, melons, alfalfa, green onions, green turnips, tomatoes, string beans, cabbage, milk cows (man hours only), meat hog and mule (man hours only).

76. Johnson, E. R., and Nuckols, S. B. Farm management problems on irrigated farms in hay and potato areas of the Yakima Valley, Washington. Washington, 1926. 64 p. (U. S. Dept. Agr. Bul. 1388)

Distribution of farm resources of land, capital and labor per farm, on farms of different size: table 9, p. 17.

Numerous tables show man and horse hours required in the various operations in producing and harvesting potatoes, rutabagas, sugar beets, alfalfa, corn for silage, squash, corn for grain, wheat, oats, and barley. Table 21, p. 31 also gives hours used in marketing these crops.

Labor and material requirements of livestock: p. 48-49.

77. Johnson, N. W., and Severance, George. An economic study of berry farming in western Washington. Pullman, 1926. 79 p. (Wash. Agr. exp. Sta. Bul. 204)

"The results are given of the study made on 116 berry farms in 1924 and 1925 to determine (1) the factors in their organization which make for success or failure, (2) What types of farming may be combined most profitably with berry farming (3) the cost of production for different kinds of berries, and (4) the labor distribution and labor problems."—Experiment Station Record, v. 55, p. 585.

Labor studies: p. 55-66. Man and horse labor requirements for raspberries, loganberries, blackberries, and strawberries are given.

78. Johnson, O. R., and Frane, B. H. The cost and income of the farm poultry flock. Columbia, 1924. 20 p. (Mo. Agr. exp. sta. Bul. 219)

"Deals with the poultry enterprise on the farms cooperating with the rural life department of the Missouri Agricultural Experiment Station in keeping complete farm records. The data include the years 1912 to

1922 inclusive..." p. 3. Man and horse labor requirements of poultry, monthly, 1912 to 1922, are tabulated on p. 4-5.

79. Jones, M. D. Methods used in growing peas for canning in Maine and the problems connected with their economical production. Orona, 1927. 80 p. (University of Maine studies, 2d ser., no. 9. - The Maine Bulletin v. 29, no. 13, May, 1927) 500 M28
"It is the purpose of this investigation: (1) to give the history and present status of the pea canning industry in Maine; (2) to describe the methods now being used in growing the canning crop in this state; (3) to show what effect certain production practices apparently had upon the yield of shelled peas in 1925."
Labor requirements: p. 41-44.
Cost of production: p. 44-45.
Labor requirements in relation to acres of peas per farm: p. 52-54.
80. Josephson, H. B. Power and labor studies in Pennsylvania. (In Agricultural Engineering, v. 9, July, 1928, p. 219-223) 58.8 Agr83
Not examined.
"This is a progress report of studies at the Pennsylvania Experiment Station, the purpose of which is to reduce the power and labor requirements of the operations involved in corn, oats, wheat, hay, and potato production and in tillage to a profitable minimum by engineering procedure. A detailed analysis of the power and labor requirements of each operation is presented.
"It was found that when a general-purpose tractor was substituted for common Pennsylvania practice in field operations, a large saving in labor was effected in most operations. The total cost was also reduced in many major operations but increased in some minor ones because of low load factor and sometimes because of high machinery cost, both of which were results of small crop acreage." -Experiment Station Record, v. 60, p. 79.
81. Kansas. Agricultural experiment station. Director's report, 1922-1924. Manhattan, 1924. 145 p.
Table 1, Average labor [man labor and horse work hours] and material requirements for crop [wheat, oats and corn for silage] production in McPherson County, annually, 1921-1923, p. 17.
82. Kansas. Agricultural experiment station. Director's report, 1924-1926. Manhattan, 1926. 162 p.
A report on a five-year study on cost of production routes in McPherson and Jackson counties is given on p. 18-21. This includes three tables on standard requirements for wheat operations in McPherson County, standard requirements for corn operations in Jackson County, and standard requirements for work horses in both counties. Man labor and horse labor hours are included in the data given.

83. Kaupp, B. F. I. The cost of producing eggs with S. C. white leghorns, and II. The control of roup and its effect upon egg production, Raleigh, 1928. 11 p. (N. C. Agr. exp. sta. Bul. 254)
Labor: p. 4. A table gives man and truck hours for detailed operations in connection with producing eggs.
84. Kentucky. Agricultural experiment station. [Investigations in agricultural economics at the Kentucky station, 1926], (In its Rept. 1926, pt. 1, p. 10-14)
The following is quoted from the Experiment Station Record, v. 58, p. 79: "From 18 to 49 hours, averaging 33 hours, of man labor, and from 33 to 75 hours, averaging 50 hours, of horse work were required in the production of one acre of corn on 19 farms in Graves, Callo-way, and Marshall Counties in 1924. In 1925, from 25 to 35 hours, averaging 39 hours, of man labor, and from 36 to 68 hours, averaging 43 hours, of horse work were used."
85. Kidder, A. F., and Dalrymple, W. H. "Hogging down crops." Cost of producing crops and pork. Baton Rouge, 1923. 19 p. (La. Agr. exp. sta. Bul. 187)
Table I, p. 6, shows man and horse hours used in "hogging down" sweet potatoes, corn, soybeans, cowpeas and combinations of these crops. Table II, p. 7, shows per acre costs in hours. Table XIII, p. 17, shows labor cost of "hogging down" corn and cowpeas, corn and soybeans, corn, soybeans and sweet potatoes per acre, per 100 pounds of feed and per 100 pounds of pork.
86. Kifer, R. S., Humphries, W. R., and Martin, J. H. Harvesting wheat with a combined harvester-thresher in the Great Plains region, 1926. Washington, 1927. 26 p.
This is a preliminary report issued by the U. S. Dept. of Agriculture, Bureau of Agricultural Economics, Bureau of Public Roads, Bureau of Plant Industry, in cooperation with Texas, Oklahoma, Nebraska, and Montana Colleges of agriculture.
Table 12, p. 17, shows charges made for different harvesting methods per acre. This includes quantity and cost of man labor and horse labor.
87. Kinsman, C. D. An appraisal of power used on farms in the United States. Washington, 1925. 76 p. (U. S. Dept. Agr. Dept. bul. 1348)
Selected bibliography: p. 73-75.
Power and labor requirements of farm operations: p. 17-19, 57, 58.
Power and labor requirements of farm commodities: p. 19.
Charts and tables show distribution of horse and man labor on farms of different sizes, and also for the following crops: corn, corn silage, wheat, cotton, alfalfa, potatoes, tobacco, rice, sugar beets, truck crops, fruit, and cowpeas and soybeans in various parts of the United States.
Distribution of man labor on 7 work horses, 8 dairy cows, hogs and poultry is given in a chart on p. 41. Data are taken from U. S. Dept. Agr. Bul. 1271.

Approximate average labor and power requirements for care of live-stock (horses; dairy cows; young stock, cattle, colts, etc.; steers; hogs): table X, p. 60.

Approximate percentage of labor and animal power devoted to each enterprise on different types of farms as determined by records kept on a limited number of farms of each type: table XVII, p. 68.

88. Klemmedson, G. S. Costs and methods in carrying cattle on national forest ranges in Colorado, Wyoming, Montana, Utah and Idaho in 1923. A preliminary report. Washington, D. C., July, 1924. 10 p. Mimeographed 1.9 Ec75Cc
Issued by the U. S. Dept. of Agriculture, Bureau of Agricultural Economics in cooperation with the Colorado Agricultural Experiment Station, Dept. of Economics and Sociology.
Reprinted in Cattleman, v. 11, no. 4, Sept. 1924, p. 25, 27-29, 31.
Labor requirements in running cattle on forest ranges: p. 5-6.
89. Klemmedson, G. S. Cost and methods of carrying cattle on national forest ranges in Colorado, Wyoming, Montana, Utah, Idaho, Oregon, Washington, California, and South Dakota. A preliminary report. Washington, D. C., January, 1926. 10 p. Mimeographed. 1.9 Ec75Cc
Issued by the U. S. Dept. of Agriculture, Bureau of Agricultural Economics in cooperation with the Colorado Agricultural Experiment Station, Department of Economics and Sociology.
Labor requirements in running cattle on forest ranges: p. 7-8.
90. Klemmedson, G. S. An economic study of the costs and methods of range cattle production on forty-one ranches in Colorado, 1922. 22,285 cows and their calves. Preliminary report. Washington, D. C., April 1, 1924. 34 p. Mimeographed. 1.9 Ec75Cc
Colorado Agricultural Experiment Station and the U. S. Dept. of Agriculture, Bureau of Agricultural Economics and Bureau of Animal Industry cooperating.
Tables on p. 29 and 30 show labor requirements in cost of producing range cattle in Colorado, 1922, on 24 mountain ranches and on 17 prairie ranches.
91. Klemmedson, G. S., and Reinholt, Martin. An economic study of the costs and methods of ranch cattle production on fifteen plains ranches in Colorado, 1924. Preliminary report. Fort Collins, Colorado, Dec. 20, 1925. 8 p. Mimeographed. 1.9 Ec75Cc
Issued by the U. S. Dept. of Agriculture, Bureau of Agricultural Economics in cooperation with the Colorado Agricultural Experiment Station.
Ranch labor: There was an average of 2.89 men employed per ranch the year around, of which 1.87 men were employed as cattle labor and 1.02 men employed to take care of the hay and farming operations. The men employed on cattle handled on average of 653 cattle units per man. Some ranches handled as high as 1,067 cattle units per man and others as little as 167 cattle units per man. The average ranch required 1.84 months of cattle labor per 100 animal units made up of all classes of cattle. Men employed on the farming operations handled 172 acres of

crops per man. Forty-nine per cent of all labor on cattle was performed by ranch owners and unpaid family labor": p. 7-8.

92. Klemmedson, G. S., and Reinholt, Martin. An economic study of the costs and methods of range cattle production on twenty-eight mountain ranches in Colorado, 1924. Preliminary report. Fort Collins, Colorado, Jan. 5, 1926. 11 p. Mimeographed. 1.9 Ec75Co

Issued by the U. S. Dept. of Agriculture, Bureau of Agricultural Economics and the Colorado Agricultural Experiment Station cooperating. Ranch labor: p. 7.

93. Klemmedson, G. S., Reinholt, Martin; and Parr, V. V. An economic study of the costs and methods of range cattle production on forty-one ranches in plains and mountain areas of Colorado, 1923. A preliminary report. Washington, D. C., Feb. 1926. 54 p. Mimeographed. 1.9 Ec75Co

Issued by the U. S. Dept. of Agriculture, Bureau of Agricultural Economics and Bureau of Animal Industry in cooperation with the Colorado Agricultural Experiment Station.

The material in this report is tentative and based upon one year only.

Quantities of feed and labor required and annual cost of carrying a range cow and cost of raising a calf to weaning time on prairie ranches, 1923: table 1, p. 9.

Factors influencing the range cattle production on 15 prairie ranches in Colorado, 1923. Hours of man labor per cow are given: table 4, p. 12.

Ranch labor: p. 26-28. Includes a table on the amount and efficiency of labor, 15 prairie ranches, 1923.

Factors influencing the cost of producing range cattle on 26 mountain ranches in Colorado, 1923: table 21, p. 37-38a. Hours of man labor per animal unit are included in the data.

94. Kuenning, A. C. Fact-finding for northwestern North Dakota farming 1908-1924. Agricultural College, 1925. 36 p. (N. Dak. Agr. exp. sta. Bul. 190)

Tables 9-12 give in detail man and horse labor requirements per acre on irrigation demonstration farm unit, Williston Substation, 1923 for flax, peas, beans, beets, potatoes, corn (grain, silage), and alfalfa; and for alfalfa, corn, sugar beets, peas and beans, and flax and wheat in 1924.

95. La Mont, T. E. The cost of producing apples on 129 farms, Newfane Township, Niagara County, 1926. Ithaca, 1928. (In Cornell Univ. State col. agr. Dept. agr. economics and farm management. Farm economics no. 55, Nov. 1923, p. 990-992)

Table 2, p. 992, gives average hours, per acre and per barrel; of man labor required to produce apples on 129 Newfane orchards over 30 years old, 1926. Data are given for both Dunkirk and Clyde soils.

96. Langsford, E. L., and Hutson, J. B. Systems of beef cattle farming for southwest Virginia. Blacksburg, 1927. 47 p. (Va. Agr. exp. sta. Bul. 258)

Table 3, p. 11, Normal annual production and production requirements [including man labor hours] for sheep, hogs, dairy cows, workstock, and poultry.

Table 4, p. 12, Normal yields and production requirements [including man labor and horse work hours], acre basis, for corn, silage corn, barley, mixed hay, wheat, and rye cover crop.

Table 6, p. 16, Land, man labor, horse work and cash costs used in growing silage and non-silage rations for wintering steers.

Charts on p. 21 and 22 show man labor and horse work distribution on farm 3 according to enterprises (miscellaneous, work stock, beef cattle, sheep, other live stock, hay, rye, oats, corn, total labor).

Charts on p. 29 and 30 show man labor and horse work distribution on suggested system 1 according to enterprises (miscellaneous, other livestock, sheep, beef cattle, rye cover, mixed hay, barley, corn silage, corn, and total labor).

Charts on p. 34 and 35 show man labor and horse work distribution on suggested system 4 by enterprises (miscellaneous, other livestock, sheep, beef cattle, mixed hay, barley, corn, and total labor.)

Tables in the Appendix give man labor and horse hours for steers, sheep (man labor only), 100 pounds of pork, cutting and shocking fodder corn, work stock, corn up to cutting, wheat, oats and mixed hay.

97. Larson, C. W., and others. The dairy industry. Washington, 1923. (In U. S. Dept. agr. Yearbook, 1922, p. 281-394)

Unit requirements for producing 100 pounds of milk in Vermont, Delaware, Louisiana, Indiana, Nebraska, and Washington are given in table 4, p. 248. Data include hours of human and horse labor.

Distribution of labor on a dairy herd; figure 57, p. 350.

98. Lescohier, D. D. Conditions affecting the demand for harvest labor in the wheat belt. Washington, 1924. 46 p. (U. S. Dept. agr. Bul. 1230)

"Amounts of labor used in the wheat harvest"; p. 5-14. Table 1 in this section shows the "amounts of labor actually used in the 1921 harvest per 100 acres of wheat harvested and per 100 acres of small grain harvested" in certain counties of Oklahoma, Kansas, Nebraska, South Dakota, North Dakota, Minnesota, and total.

Table 3, p. 11: Length of the 1921 harvest period by size of farms.

"Labor demand in threshing": p. 24-30.

Table 8, p. 32: "Hours worked per day by harvest and threshing crews, 1921."

Table III, p. 41-42: Amount of labor used per acre of grain harvested on farms using binders, headers, and combines, by States and counties.

99. Lipscomb, J. N., and Byrd, H. A. Progress report on cost of production route in Choctaw County, Mississippi in 1924. A. & M. College, 1925. 13 p. (Miss. Agr. exp. sta. Bul. 228)

"The labor [man and horse hours] and material requirements and yield

per acre of cotton, corn, lespedeza hay, and oats and the unit requirements of 1 head of work stock, 1 dairy cow, and 1 hen, and for the production of 1 lb. of pork are tabulated." -Experiment Station Record, v. 55, p. 181.

100. Lipscomb, J. H., and Goodell, C. J. Silage and silage costs in Mississippi. A. & M. College, 1925. 16 p. (Miss. Agr. exp. sta. Bul. 229)

On p. 7 there is a summary table which shows, among other items, the man hours and the horse hours used in filling 25 different Mississippi silos. The silage used was in most cases either corn or sorghum.

101. Long, L. E., and Allen, J. R. Progress report on cost of production route in Jones County, Mississippi, 1927. A. & M. College, 1928. 36 p. (Miss. Agr. exp. sta. Bul. 256)

Detailed data on cost of producing cotton, corn, hay, sweet potatoes, sugar cane, and gardens, 1927; cost of maintaining workstock, milk cows, poultry (cost per dozen eggs), 1927; and cost of producing pork are given. Man labor, horse labor and sometimes truck and tractor use per acre by operations are given for cotton, corn, hay, sweet potatoes, and sugar cane. Man labor is also given for workstock, milk cows, poultry, and pork.

102. Long, L. E., and Kifer, R. S. Systems of farming for the hill sections of Mississippi. A. & M. College, 1923. 50 p. (Miss. Agr. exp. sta. Bul. 257)

Data on materials and labor used for crop production and livestock production are given on p. 13-27 in both charts and tables. Man and horse labor hours are given for cotton, corn, oats, lespedeza hay, and sweet potatoes. Man labor hours are given for work stock; for milk cows, for poultry per head, and for 100 pounds of live pork.

103. Long, L. E., and Reynolds, H. W. Progress report on cost of production route in Choctaw County, Mississippi, 1925. A. & M. College, 1926. 23 p. (Miss. Agr. exp. sta. Bul. 237)

Tables include data on man and horse labor hours for cotton, corn, oats, lespedeza hay, sorghum for syrup, dairy cattle, and 100 pounds of pork. Man labor hours are also given for workstock and poultry.

104. Long, L. E., and Reynolds, H. W. Progress report on cost of production route in Choctaw County, Mississippi, 1926. A. & M. College, 1927. 18 p. (Miss. Agr. exp. sta. Bul. 243)

Tables include data on man and horse labor per acre for cotton, corn, and oats, and for dairy cows, and man labor for workstock, poultry, and 100 pounds of pork.

105. Long, L. E., and Swinson, C. R. Cost of producing cotton in fifteen selected areas, 1923. Preliminary report. Washington, July, 1925. 18 p. Mimeographed. 1.9 Ec7620

U. S. Dept. of Agriculture, Bureau of Agricultural Economics, Division of Farm Management and Costs and state colleges of agriculture of North Carolina, South Carolina, Georgia, Alabama, Mississippi, Arkansas, Oklahoma, and Texas cooperating.

Tables 1 and 2 show average man labor and mule labor requirements per acre for producing cotton, by operations, 15 areas, 1923.

106. McCollan, M. E. Production costs and storage of mangels. Puyallup, 1924. (In West. Wash. Agr. exp. sta. Bi-monthly bul. v. 12, no. 1, May, 1924, p. 22-24)

Two tables show man, horse, and tractor costs in hours and dollars and cents. Costs were obtained from records on a five-acre demonstration field of mangels grown on lowland muck soil.

107. McCuen, G. W. Motorizing the corn crop in Ohio. (In Agricultural Engineering, v. 5, no. 12, Dec. 1924, p. 268-279) 58.8 Agr83

"In a contribution from the Ohio State University a study is briefly reported on the question of saving man-hours of labor or of increasing the labor output per man with reference to corn production. A direct comparative study was therefore made of horse and motor equipment in the same field under the same conditions. The data indicate an average saving of 0.95 man-hour per acre by the use of motor power over horsepower. It was further indicated that in final cultivations a man can cover 50 per cent more acreage a day with a motor cultivator than can be covered with horse-drawn equipment." - Experiment Station Record, v. 52, p. 688.

This paper was presented at the eighteenth annual meeting of the American Society of Agricultural Engineers, Lincoln, Nebraska, June, 1924.

108. McKinley, Bruce. An economic study of potato farming in the Hastings area for the crop year 1925. Gainesville, 1928. p. 173-275. (Fla. Agr. exp. sta. Bul. 193)

"Presents data regarding production, expenses, receipts and net returns from farms on which the growing of potatoes for Northern markets is the chief business. The results apply to potato farms rather than to highly specialized truck farms, fruit farms or general farms in Florida."-p. 177. Pages 226-245 are devoted to data on distribution of man labor, horse labor and truck and tractor hours on the potato farms in the areas studied.

109. McNair, A. D. Labor requirements of Arkansas crops. Washington, 1924. 64 p. (U. S. Dept. agr. Dept. bul. 1181)

"Presents both in chart and tabular form, the quantity of man and horse labor expended on each of the important crops raised in Arkansas, distributed by months and by operations. All charts and tables are made on the basis of 10 acres except those for a few fruit and vegetable crops and for rice, which are made on the basis of 1 acre and 100 acres, respectively." Crops for which data are given are: alfalfa, apples, soybeans for seed, Bermuda hay, blackberries, muskmelons, cherries, red clover, clover and timothy, corn, cotton, cow-

peas, cucumbers, grapes, oats, oats and cowpeas, oats and lespedeza, Elberta peaches, Spanish peanuts, Kieffer pears, potatoes, sweet potatoes, radishes, rice, sorghum molasses, sorghum cane for factory, strawberries, timothy, cannery tomatoes, watermelons, and wheat.

110. McNall, P. E., and Ellis, L. S. Farm costs and practices in the production of Walworth County crops and livestock. Madison, 1928. 103 p. (Wis. Agr. exp. sta. Research bul. 83)

"The costs of production and unit requirement figures given in this bulletin are based on the results secured from records kept on 24 farms in 1922, 22 farms in 1923, and 20 farms in 1924, all in Walworth county, Wisconsin."

Man labor and horse work requirements per acre by operations, and standard labor requirements for producing corn, corn silage, shredding corn, oats, barley, alfalfa, mixed hay, and peas are given. Labor requirements for cows, heifers, calves, bulls, horses, poultry and for producing 100 pounds of pork are also given.

111. McNall, P. E., and Hartmen, W. A. Cost of filling silos. Madison, 1926. 12 p. (Wis. Agr. exp. sta. Bul. 386)

Data on man work and horse work hours are included.

112. McNall, P. E., Kifer, R. S., and Mitchell, D. R. Planning the farm for profits. Madison, 1927. 24 p. (Wis. Agr. exp. sta. Bul. 395)

Tables I, V, IX, and XIII give the following information: crops produced and how used, and labor and materials used in production on farms of different sizes and of different types. Crops for which man labor and horse work hours are given are corn silage, corn grain, barley, oats, mixed hay, alfalfa, potatoes, canning peas, sweet clover, and total crops for each farm.

113. Martin, J. H., and others. Harvesting grain sorghums. Washington, 1928. 17 p. (U. S. Dept. agr. Farmers' bul. 1577)

The main facts in this bulletin as to labor requirements are also given in an abstract entitled "Labor Requirements and Costs in Harvesting Grain Sorghums" in the Monthly Labor Review, v. 28, no. 1. Jan. 1929, p. 49.

114. Mason, C. R. The vegetable industry of Pennsylvania. Harrisburg, 1925. 142 p. (Pa. Dept. agr. Bul. v. 7, no. 12, July 15, 1925. General bul. 408)

Cost of growing late cabbage in New York: table 3, p. 65. Hours of man labor and horse labor per acre for 1921, 1922 and 1923 are given.

Figures on p. 102 show costs of production per acre of the canning tomato crop in counties of New York, Ohio, and New Jersey, and in Lancaster Co., Pennsylvania. Labor requirements are not given.

Cost of production data for watermelons in Lancaster County, 1922 and 1923 are given on p. 129. Average number of man and horse hours are included.

115. Matthews, C. A., Shaw, J. M., and Weaver, Earl. The economy and efficiency of a milking machine. Ames, 1928. p. 203-223. (Iowa. Agr. exp. sta. Bul. 248)
Labor saved by machine milking: p. 219-222. Table VIII shows relative labor requirements of machine milking. Table IX shows labor efficiency as dependent on the size and production of the herd. Data for both hand hours and machine hours are given.
116. Meal, W. G. Cost of producing onions in the Elba truck land area, western New York, 1925. Ithaca, 1928. (In Cornell Univ. State Col. agr. Dept. agr. economics and farm management. Farm economics, no. 53, June, 1928, p. 924-926)
Tables showing average costs of growing, harvesting, and marketing onions are given. Among the data are the quantity and cost of man and horse labor. Tractor use is also given in the cost-of-marketing table.
117. Mendum, S. W. Cost of milk production on 48 Wisconsin farms. Washington, 1923. 23 p. (U. S. Dept. agr. Bul. 1144)
"Labor applied to milk production": p. 10-12. Table 3, p. 10, gives "labor requirements - hours of labor per farm, per cow and per 100 pounds of milk produced, together with variations observed, on 48 Wisconsin dairy farms in 1920."
118. Mighell, R. L. Factors affecting returns from potatoes in Massachusetts. Amherst, 1928. p. 69-95. (Mass. Agr. exp. sta. Bul. 240)
"This bulletin reports the results of a study of the records for the year 1926, obtained by personal visits to 54 farms in 4 areas in Massachusetts. The acreage, maximum and minimum acreage in potatoes, yields per acre, total hours of labor per acre, and hours of labor for different operations are reported for each section, and the acreage in potatoes, yields per acre, and amounts of seed, fertilizer, manure, and spraying and dusting materials are given for the individual farms. Estimated annual costs of special potato machinery per machine and per acre, based on data secured from 69 farmers, and the differences in labor requirements on farms using hand and machine methods, based on data for 1924-1925 from 120 farms, are also included. Suggestions for reducing costs of production and increasing returns are given." -Experiment Station Record, v. 59, p. 485-486.
119. Misner, E. G. Economic studies of dairy farming in New York. VIII. Grade B milk with cash crops and mixed hay roughage, crop year 1924. Ithaca, 1928. 38 p. (N. Y. Cornell. Agr. exp. sta. Bul. 462)
"Reports the results for the year ended April 30, 1925, the fourth year of a study of dairy farms in the vicinity of Earlville and Hamilton, Madison County, and Sherburne and North Norwich, Chenango County, New York.
Table 21, Labor required: p. 22. This gives man and horse labor for cows and for heifers.
Numbers I-VII in this series are bulletins 421, 433, 438, 441, 442, 452, and 455.

120. Misner, E. G. An economic study of dairying on 163 farms in Herkimer County, New York. Ithaca, 1924. 59 p. (N. Y. Cornell. Agr. exp. sta. Bul. 432)

Labor: p. 15-17. Table 12 shows in detail the human labor used for all cattle and also the hours and value of human labor used for heifers, herd bulls, and veal calves. Table 13 shows the distribution of labor on cows by operations. Table 14 gives the hours and value of horse labor used for cows, heifers, herd bulls, and all cattle.

121. Missouri. Agricultural experiment station. Solving farm problems by research. One year's work, Agricultural experiment station (Report of the Director; July 1, 1926 to June 30, 1927). Columbia, 1927. 102 p. (Its Bul. 256)

On p. 39 there is a short report on a study of the utilization of labor on the farm made by O. R. Johnson and B. H. Frame. Results are summarized in a table which gives man, horse and tractor labor requirements of corn, wheat, oats and soybeans, 1926, and man and horse requirements for cowpeas. Number of acres sown to each crop is also given.

Bulletin 228 which is the 1923/24 report contains tabular data showing percentage distribution of man and horse labor by operations on corn, 1912-1922.

122. Missouri. Agricultural Experiment station. Some new developments in agricultural science...Report...July 1, 1924, to June 30, 1925. Columbia, 1926. 90 p. (Its Bul. 236)

On p. 75 and 76 there is a report (3 tables) by O. R. Johnson on labor distribution on miscellaneous farm activities. Man labor and horse labor hours are given for the household, real estate, outside work, the general farm, garden and orchard, feed and seed, and equipment.

123. Moorhouse, L. A. The management of the farm. New York, London, D. Appleton and company, 1925. 526 p. 281 M73

"References" at end of chapters.

Chapter IV, p. 63-79, is entitled The Availability and Quality of Farm Labor in Relation to Types of Farming. Among other phases of the subject, seasonal distribution of labor and labor required in wheat farming, cotton farming, and in the Corn Belt are discussed. Charts also are given.

Manual labor and horse labor are discussed on p. 174-176.

Numerous tables and charts in the chapters on the organization and management of the different kinds of farms show labor distribution and labor and materials required in producing corn, corn silage, wheat, cotton, potatoes, sugar beets, tobacco, apples, canning peas, cabbage, onions, tomatoes, beef cattle, dairy cows, milk, and hogs.

124. Moorhouse, L. A., and Summers, T. H. Saving man labor in sugar-beet fields. Rev. Washington, 1928. 14 p. (U. S. Dept. agr. Farmers' bul. 1042)

"This bulletin tells how man labor can be saved and production speeded up in the several American sugar-beet regions through the use of large machines and units of power."

125. Moorhouse, L. A., Burdick, R. T., and Hutson, J. B. Factors that influence profits on irrigated farms. Fort Collins, 1927. 49 p. (Colo. Agr. exp. sta. Bul. 318)

"The results are given of a study by the route method of about 25 farms in the irrigated districts of northern Colorado during the years 1922-1925. Data as to man labor, horse work, seed, and fertilizer and other materials used in crop growing; the feed, man labor, horse work, and miscellaneous cash cost in producing livestock and livestock products; and the crop yields and livestock production were obtained for from one to four years on the several farms."- Experiment Station Record, v. 57, p. 189.

Man labor, horse and tractor hours are given for sugar beets, potatoes, alfalfa, wheat, barley, and beans. Man labor is also given for oats, feeder cattle and livestock. Horse work is also given for peas, oats, cabbage, and feeder sheep.

126. Morison, F. L. Dairy and other livestock production costs in Medina County, Ohio. Wooster, 1928. 53 p. (Ohio. Agr. exp. sta. Bul. 424)

"Presents an analysis of the livestock production costs of 23 farms in the east-central part of Medina County, in the heart of the dairy region of north-eastern Ohio. The data were collected during the 5-year period ending December 31, 1924." There are numerous tables which include data on man labor per cow; per cow on farms with and without milking machines; per 100 pounds of milk; per bull; per 100 chickens; hogs; and sheep (horse work given also).

127. Myers, K. H. The cost of producing sugar beets in northwest Ohio, 1926. Columbus, 1927. 4 p. (Ohio. State univ. Col. agr. and domestic science. Dept. of farm crops. Crop talk, no. 42) 275.29 Oh33

Table 2, shows amount of labor (man, horse, tractor) and material used in producing one acre of sugar beets, 1926. Table no. 3, shows labor distribution on sugar beets per acre. Table no. 5, shows sugar beet costs and requirements (man, horse, and tractor hours) per acre as compared with corn and wheat.

128. New Hampshire. Agricultural experiment station. Agricultural experiments 1927. Annual report of the director. Durham, 1928. 35 p. (Its Bul. 232)

"How much labor does an [apple] orchard require?" p. 4-5. Hours of human labor are given.

In a report on a study of the cost of producing potatoes in New Hampshire (p. 21-22) conducted by M. F. Abell, hours of man labor are given.

129. Nicholls, W. D. A study of the cost of producing tobacco in Kentucky. Lexington, 1926. p. 441-526. (Ky. Agr. exp. sta. Bul. 275)
Thesis (Ph.D.) Cornell University, 1926.
Man labor and horse work in producing burley and dark fire-cured tobacco: p. 515-526.
130. Nicholls, W. D., Jett, C. U., and Galloway, Z. L. A study of farm organization and management in Mason and Fleming counties. Lexington, 1924. p. 39-84. (Ky. Agr. exp. sta. Bul. 253)
Labor efficiency: p. 47-50. This includes a table, Approximate Work Units Needed for Various Farm Enterprises. This gives man labor and horse work units per acre for burley tobacco, corn (shocked and put into crib), corn (hushed from stalk), corn (hogged down), corn silage, wheat, rye (threshed), rye (cut and fed as hay), rye (pastured or turned under), oats (threshed), oats (fed in bundles), meadow hay, bluegrass, cowpeas and soybeans, melons, apples, berries, grapes, peanuts, gardens, ordinary milk cows on farms, dairy cows, beef cattle or general stock cattle, horses, sheep, swine, and poultry.
131. North Carolina. Agricultural experiment station. Recent results of work ...and the present program of work. Raleigh, 1925. 72 p. (Its Bul. 247)
In a brief report on a study of the cost of production of milk (p. 21), the following statement is made: "In winter the human labor of production and distribution amounted to 28.9 hours per cow per month, while in summer 27.1 hours were expended per cow per month."
132. Ohio. Agricultural experiment station. Annual report, 45th, 1925/26. Wooster, 1927. 156 p. (Its Bul. 402)
Feed and other requirements for pork production: p.103-104. Man labor and horse work hours are included in the requirements.
133. Ohio. Agricultural experiment station. Annual report, 46th, 1926/27. Wooster, 1928. 118 p. (Its Bul. 417)
"Cost of cultivating corn in different sized fields": p. 77.
There is a table on this page which shows efficiency in the use of one-and two-row cultivators in different sized fields, 1926, Putnam County. Man hours per acre are included in the data.
"Season of egg production as related to profits": p. 77-78. In a table in this section hours of labor per 100 chickens are included.
134. Ohio. State university. College of agriculture and domestic science. Extension service. Facts about the cost of market milk production in Ohio. [Columbus, 1928?] 4 p. 275.20h32Fa
Among data given in a table on cost factors per cow and per 100 pounds of milk in herds of varying production per cow (5-year average, 1920-1924, Medina County, Ohio) are hours of labor expended.
Hours of labor per cow are also given in Table II, Spring freshening as related to cost of milk production, by groups of farms, Medina County, Ohio, 1920-1924.

135. Overton, M. H. A study of the cost of producing wheat and oats in central and southern Indiana (data from Hancock and Washington counties). Lafayette, 1923. 24 p. (Ind. Purdue. Agr. exp. sta. Bul. 272)
Tables showing labor requirements are given on p. 14-22. Man hours, horse hours, and tractor hours are given.
136. Parr, V. V., and Klemmedson, G. S. An economic study of the costs and methods of range cattle production in north central Texas. 15 ranches - 1920, 1921, 1922. 40 ranches 1923- 65,458 cows and their calves. Preliminary report. Washington, D. C., May 1, 1925. 40 p. Mimeographed.
Issued by the U. S. Dept. of Agriculture, Bureau of Agricultural Economics and Bureau of Animal Industry.
Factors influencing beef production on 40 ranches in north central Texas, 1923: table 8. Includes data on hours of man labor used per cow.
Labor: p. 29-31. Labor requirements on different sized ranches, north central Texas, 1923: table 21, p. 31.
137. Parr, V. V., and Klemmedson, G. S. An economic study of the costs and methods of range cattle production in the northeastern range area of Texas, 1920, 1921, 1922, 15 ranches - 38,511 cows and their calves. Preliminary report. Washington, D. C., U. S. Dept. of agriculture, Bureau of agricultural economics, April, 1924. 24 p. Mimeographed. 1.9 Ec75Ec
Reprinted in the Cattleman, v. 10, no. 12, May, 1924, p. 9-20.
Ranch management and labor: p. 18-19. Table XIV, p. 19, shows man labor requirements and cost in producing cattle on 15 ranches southwest of Wichita Falls, Texas, 1922. Table XV, p. 20, shows average labor requirements on cattle on 15 ranches southwest of Wichita Falls, Texas, 1920, 1921, 1922.
138. Pennsylvania. Agricultural experiment station. Annual report, 39th, 1925/26. State College, 1926. 47 p. (Its Bul. 204)
On p. 32 and 33 there is a brief report on a project on the cost of raising a pullet from hatching time to maturity, by M. H. Brightman. Number of hours of labor used is stated to be 934.72.
139. Pennsylvania. Agricultural experiment station. Annual report, 40th, 1926/27. State College, 1927. 42 p. (Its Bul. 213)
"Power and Labor studies. A bulletin will be published soon giving a brief progress report of the work on this project for two years. The power and labor factors involved in crop production have been studied on the college farm during the past year in an effort to find means of reducing the cost of production through more economical machinery methods, involving five crops: corn, oats, wheat, hay, and potatoes. Each operation has been performed by conventional methods as well as by other methods which might present possibilities of reducing costs. All items entering into operating costs have been carefully recorded. In potato growing, for example, the labor required in picking the potatoes off the ground and loading them into a wagon was found to be over 40 per cent of the total labor requirement of

the crop...H. B. Josephson." p. 23.

The 1927/28 report (Bul. 230, p. 27) also contains a progress report on this project.

140. Peterson, William, and others. Cattle ranching in Utah. Logan, 1927.

56 p. (Utah. Agr. exp. sta. Bul. 203)

Labor requirements: p. 27-28. Table 3, p. 27, shows "labor requirements by number of months, the total value of all labor and the percentage of total labor represented by paid, family, and operator labor on cattle ranches - Utah 1925."

141. Pingrey, H. B. A preliminary report...The cost of growing sugar beets in 1922 and 1923, Weld County, Colorado. Fort Collins [1924?], 27 p. Mimeographed. 66 F65

Colorado Agricultural Experiment Station, Department of Economics and Sociology and the U. S. Dept. of Agriculture, Bureau of Agricultural Economics cooperating.

Table II, p. 5 shows direct man labor in producing sugar beets. Table III, p. 7 shows horse labor hours and cost per acre in producing sugar beets.

142. Piper, C. V. Hay, Washington, 1925. (In U. S. Dept. agr. Agriculture Yearbook, 1924, p. 285-376)

"Labor requirements of hay crops": p. 350.

Man and horse labor requirements for harvesting hay are given on p. 366-376. On p. 368 there is a table which shows the average hours of labor used in harvesting hay and quantity of seed used in establishing a meadow. Kinds of hay are mixed, timothy, clover and alfalfa.

143. Pond, G. A. A study of dairy organization in southeastern Minnesota. 1926. 94 p. and Appendix. (Minn. Agr. exp. sta. Tech. bul. 44)

"Tables are given showing for the several farms in 1924 the amounts of feeds of different kinds, man labor, horse work, and veterinary services used per dairy cow, per young dairy cattle, per 100 chickens, per work horse, and per colt, and to produce 100 lbs. of pork in 1923... Charts showing the man distribution by weeks for the year, and standards for feeds, man labor, horse work, and cash cost for the different kinds of stock are given..."

"The usual practices in producing different crops are described and tables given for each crop showing the standard man labor and horse work requirements and the distribution of labor. Tables are appended showing by farms in 1922 the man labor and horse and tractor work required for different operations in raising and harvesting the different crops, and the averages for all farms for each of the other years." -Experiment Station Record, v. 57, p. 285. Crops for which labor requirements are given are corn (up to harvest time, husked, husked and shredded, cut and shocked); silage corn; small grains; tame hay; wild hay; alfalfa; oats; barley; and wheat.

144. Pond, G. A., and Tapp, J. W. A study of farm organization in southwestern Minnesota. University Farm, St. Paul, 1923. 135 p. (Minn. Agr. exp. sta. Bul. 205)

"A study conducted in Cottonwood and Jackson Counties, Minn. cooperatively by the station and the Bureau of Agricultural Economics, U. S. D. A., is summarized here. Data with regard to the amounts and distribution of labor and materials used in the production of the different crops and classes of livestock on the farms contributing data and of the miscellaneous work incident to the operation of the farms were secured by the complete cost route method on 24 farms in the vicinity of Windom, beginning in March, 1920, and continuing into 1922." -Experiment Station Record, v. 50, p. 889.

Man and horse labor requirements are given for corn, silage corn, fodder corn, oats, barley, rye, flax, tame and wild hay, alfalfa, colts, dairy cows, young dairy stock, mixed cattle, swine, sheep, chickens, and miscellaneous items. Man labor requirements for work horses are also given.

Department Bulletin 1271 issued by the U. S. Dept. of Agriculture in 1924 has the same title and is by the same authors. The material in both is very similar.

145. Potter E. L., and Withycombe, Robert. Costs and profits of sheep on irrigated farms. Corvallis, 1925. 15 p. (Oreg. Agr. exp. sta. Circ. 62)

"On account of the irregularity of the hours, most farmers have practically no idea of the amount of labor which they put on their sheep. About the only data we have on this subject are the records from the Agricultural College, where the labor per ewe through a series of years has amounted to 3-1/2 hours per head per year, or 350 hours for a flock of 100 head. This is for the labor actually necessary in the maintenance of the flock as would be necessary on a commercial farm, and does not include labor of experimental weighings, record keeping, etc." p. 6.

146. Potter, E. L., Lindgren, H. A., and Oliver, A. W. Cost of producing pork. Corvallis, 1924. 12 p. (Oreg. Agr. Exp. sta. Circ. 56)
Labor requirements and cost: p. 7.

147. Rasmussen, M. P. The costs of producing maple syrup in New York and Vermont, 1921-1923. Ithaca, 1927. (In Cornell Univ. State col. agr. Dept. agr. economics and farm management. Farm economics, no. 41, Jan. 1927, p. 589-592)

Efficiency in use of labor: p. 590. The average number of hours of human labor per 100 gallons of syrup are given for both Vermont and New York.

148. Rauchenstein, Emil, and Bonnen, C. A. Successful threshing ring management. Urbana, 1925. p. 373-403. (Ill. Agr. exp. sta. Bul. 267)

Tables showing labor requirements for threshing oats, and wheat are given on p. 380-383. Man hours and horse hours per 100 bushels and per acre are given, annually, 1913-1922. Tabular data on other pages are of interest.

149. Rauchenstein, Emil, and Ross, R. C. Cost of producing field crops in three areas of Illinois, 1913-1922. Urbana, 1926. 67 p. (Ill. Agr. exp. sta. Bul. 277).
Man and horse labor, and tractor use, are included in the statistical data given. Tractor use is not given for all crops. Crops are corn, wheat, oats, clover, timothy, mixed hay, redtop, cowpeas, soybean hay, and rye.
150. Reid, R. D., and Harriott, J. K. Labor requirements for ploughing. Ithaca, 1927. (In Cornell Univ. State col. agr. Dept. agr. economics and farm management. Farm economics, no. 47, Sept. 1927, p. 766-767).
Data are based on 125 farm cost accounts for the years 1923 to 1926 inclusive. There are 4 tables which show hours of man labor required to plow one acre of sod and one acre of stubble and costs of ploughing the same.
151. Reynoldson, L. A. Field and crop labor on Georgia farms (coastal plain area). Washington, 1925. 28 p. (U. S. Dept. agr. Bul. 1292).
"This bulletin is based upon data obtained from nearly 600 farmers in the coastal plain area of Georgia who were interviewed personally. From each of these farmers a complete record was obtained covering the acreages and yields of the crops which he grew, the average time used by men and mules in different-sized crews, with different implements, width of rows, and number of furrows for various field and crop operations, the hours per day and per month available for field work, and the dates of performing different operations on cotton, corn, peanuts, sweet potatoes, sugar cane, cowpeas, watermelons, oats, wheat, and rye. No data are presented for bright tobacco as this crop is grown only on a very small acreage on these farms...
"Information was collected in three different sections of the area. (Fig. 1) The differences between the three sections are so slight that the data were combined and are presented as being representative of the entire area.
"Although studies were made only in the one State, the data should be applicable to those parts of Mississippi, Alabama, Florida, North Carolina, and South Carolina which lie within the coastal plain where soil, climate, types of farming, and farm practices are similar." -.
1-2.
152. Reynoldson, L. A., and Johnson, M. B. The corn picker in the Dakotas. A preliminary report. Washington, Sept. 1926. 9 p. Mimeographed. 1.9 Ec762Co
U. S. Dept. of Agriculture, Bureau of Agricultural Economics, Division of Farm Management and Costs and Bureau of Public Roads, Division of Agricultural Engineering, cooperated in issuing this publication.
See "work done per day" and "saving in man labor," p. 6-7.

153. Reynoldson, L. A., and Kinsman, C. D. Effective haying equipment and practices for northern great plains and intermountain regions. Washington, 1927. 28 p. (U. S. Dept. agr. Farmers' Bul. 1525)
"This bulletin aims to help ranchers to reduce the cost of haying."
"It describes the improved equipment that is used for handling hay in different sections, effective practices that are employed, and the organization and handling of haying crews on different ranches."
154. Reynoldson, L. A., and others. The combined harvester-thresher in the Great Plains. Washington, 1928. 61 p. (U. S. Dept. agr. Tech. bul. 70)
"In cooperation with the agricultural experiment stations of Texas, Oklahoma, Kansas, Nebraska, and Montana."
"Power and labor": p. 13-15.
"Elements of cost in harvesting with a combine - Labor": p. 21-24.
"The economy in the use of man labor is shown by a comparison of man-hours per acre for different methods of harvesting. Where a binder is used and the grain is cut, shocked, and threshed from the shock, the labor per acre is about 3.6 man-hours. Where the wheat is harvested with a header the labor per acre is about 2.8 man-hours as compared with about 0.75 man-hour for harvesting with a combine. [U. S. D. A. Bul. 1198]...
"The total labor for harvesting and threshing is reduced from approximately 4.6 man-hours for cutting with a binder and threshing with a stationary thresher, or 3.8 man-hours for cutting with a header and threshing with a stationary thresher, to about 0.75 man-hour per acre in cases where the work is done with a combine." p. 23.
155. Robinson, F. H. and Jensen, W. C. An agricultural production, consumption, and marketing study in the Greenville, South Carolina, trade area. Clemson College, 1927. 83 p. (S. C. Agr. exp. sta. Bul. 240)
There are a number of tables dealing with cost of production of different farm products. In these man and mule labor and tractor and auto power are given. Products for which labor requirements are given are cotton, peaches, eggs, milk, Irish potatoes, cabbage, string beans, tomatoes, corn, oats, wheat, and alfalfa hay. Auto and tractor power are not given for all products. Labor requirements for poultry farms and for maintaining one dairy cow are also given.
156. Russell, B. A. A study of economic conditions in the Lexington-Batesburg section of South Carolina. Clemson College, 1926. 36 p. (S. C. Agr. exp. sta. Bul. 233)
"The object of this study was to make an investigation of the farming conditions in regard to the organization of the farm business, to study the factors affecting income, and also to make a farm enterprise analysis showing the cost of production of the important crops in the area."
In tables showing the costs of producing one acre each of cotton, corn, wheat, oats, cowpea hay, asparagus, and peaches, and 2 tables showing the cost of developing one acre of asparagus and one acre of

peaches to 4 years of age, man and mule hours, and sometimes machinery and tractor hours required, are given.

157. Sacay, F. M. The cost of producing rice, 1926-27. (In Philippine Agriculturist v. 16, no. 4, Sept. 1927. p. 235-251.
"Literature cited": p. 247.
Basic requirements per hectare: p. 245.
Labor (man and animal) and material requirement of a hectare of rice in Pangasinan and Nueva Ecija, 1926-1927: table 4, p. 251.
158. Saville, R. J. Systems of livestock farming for the mountain region of North Carolina. Raleigh, 1928. 55 p. (N. C. Agr. exp. sta. Bul. 260)
Contains numerous charts and tables some of which show labor distribution and unit requirements for work stock, dairy cattle, young cattle, hogs, poultry, corn, wheat, rye, soybean hay, and mixed hay, on farms of different sizes.
159. Scoville, G. P., and La Mont, T. E. Data on apple varieties, cost of apple production, and profits on fruit farms. Ithaca, Cornell University, N. Y. State college of agriculture, Department of agricultural economics and farm management. 1928. [27] p. Mimeographed. 93 Sco9
This publication consists of numbered "stencils": Stencil 6444 "Cost factors on apple orchards, 129 orchards over 30 years old, Newfane, 1926," includes data on labor, fertilizer, and other requirements on Dunkirk and Clyde soils.
160. Severance, George, and Baker, G. O. Cost of producing milk and dairy farm organization in Spokane and Stevens counties. Pullman, 1924. 36 p. (Wash. Agr. exp. sta. Bul. 182)
Table X, Feed, pasture and labor (man hours) requirements per cow and per 100 pounds milk: p. 24.
161. Severance, George, and Johnson, N. W. Production and marketing of Spokane Valley farm products. Pullman, 1927. 61 p. (Wash. Agr. exp. sta. Bul. 221)
Table 11, p. 43: Hours of man labor required per acre to grow leading crops in the Spokane Valley. The crops are cantaloupes, strawberries (first and second year), tomatoes, corn, potatoes, apples, and alfalfa (first and second year).
162. Smith, H. P., and Spilman, R. F. Harvesting grain with the combined harvester-thresher in northwest Texas. College Station, 1927. 24 p. (Tex. Agr. exp. sta. Bul. 373)
Table 2, p. 8, Acres Cut Per Hour and Per Foot of Width With Machines of Different Types and Sizes.
Requirements per acre of man and horse labor used in this bulletin were taken from United States Department of Agriculture Bulletin 1198.

163. South Dakota. Dept. of agriculture. Cost of production division. Annual report, January 1, 1923. [Pierre, 1923?] 52 p. 2 So842 Mineographed.
Table I, p. 7, shows the average cost of raising ten standard crops in Oldham. Data include man hours, horse hours, and sometimes tractor hours, for wheat, corn, oats, barley, rye, flax, potatoes, tame hay, wild hay, and alfalfa.
164. Spencer, Leland. Labor requirements in growing apples in New York and in Washington. Ithaca, 1928. (In Cornell univ. N. Y. State col. agr. Extension serv. Extension bul. 172, p. 27-29)
Includes a table - Hours of labor expended in growing an acre of apples in the Wenatchee Valley and in the Yakima Valley, Washington, and in Western New York. Data are taken from U. S. Dept. of Agriculture bulletins not included in this bibliography because they were published prior to 1923.
165. Spillman, W. J. Farm management. New York, The Orange Judd publishing co., London, Kegan Paul, Trench, Trubner & co., limited, 1924. 474 p. 281 Sp42
"References" at end of chapters.
Chapter XX, p. 378-402 is on Seasonal Distribution of Labor. On p. 401 there are tables showing man and horse labor required by cattle, poultry, sheep, horses, swine, and milk cows, and in feeding steers.
166. Spillman, W. J. Farming in the Big Bend country. Pullman, 1926. 72 p. (Wash. Agr. exp. sta. Popular bul. 135)
Table 8, p. 46: Normal day's work for principal farm operations.
The following is quoted from p. 47: "The Big Bend country is a region in which the farming requires relatively little man labor and much horse labor. As a result, the amount of man labor required is reduced to a minimum. On one large farm where the Duckfoot cultivator is used instead of plows, the standard for field work is one man with 15 to 17 horses on two sections of land. This farm includes about eight sections of land, and the total equipment of farm labor consists of the owner and six hired men. Only four of these men are regularly required for field work. He keeps his hired men the year round, having them work on machinery repairing much of the time when field work is not available.
"On the larger farms where 10 horse teams are standard, the labor equipment consists usually of one man to each 10 horse team, and usually one or two extra men to look after various odd jobs on the farm."
167. Steanson, Oscar, and Moburg, E. R. Costs and methods of producing hogs, Humboldt County, Iowa, spring pigs, 1922, 1923 and 1924. A preliminary report. Washington, September, 1925. 12 p. Mineographed. 1.9 Ec762Ch
U. S. Dept. of Agriculture, Bureau of Agricultural Economics, Division of Farm Management and Costs in cooperation with Iowa State College, Department of Agricultural Economics and Farm Management.

Table 4, p. 5, shows average quantities of feed and labor required to produce 100 pounds of pork.

Table 11, p. 10, shows average quantities of feed and labor consumed per animal in breeding herd during a production year.

168. Steanson, Oscar, and Wilcox, R. H. Cost of producing hogs in Iowa and Illinois, years 1921-1922. Washington, 1926. 31 p. (U. S. Dept. agr. Dept. bul. 1381)

"Physical units required to produce 100 pounds of pork": p. 9-11. Includes man hours and horse hours for one and two litters per year, 1921, 1922, and average.

Average quantities of feed and labor required to maintain the breeding herd for one production season: table 7, p. 14.

Average quantities of feed, labor, and other costs required to produce 100 pounds gain after weaning: table 14, p. 21.

Average quantities of feed, pasture, and labor required to grow pigs to various weights: table 15, p. 22.

169. Steanson, Oscar, and Young, G. E. Cost of producing pork in Indiana, 1922, 1923, and 1924. A preliminary report. Washington, September, 1925. 13 p. Mimeographed. 1.9Ec762Cp

U. S. Dept. of Agriculture, Bureau of Agricultural Economics, Division of Farm Management and Costs in cooperation with Departments of Farm Management and Animal Industry, Purdue University, Lafayette, Indiana.

Table 4, p. 5, shows average quantities of feed and man and horse labor required to produce 100 pounds of pork, for 1922, 1923, and 1924.

Table 8, p. 10, shows average quantities of feed and labor required to maintain a brood sow for a production year.

Table 12, p. 13, shows average quantities of feed and labor consumed per 100 pounds of gain for spring pigs and fall pigs from weaning to marketing time.

170. Swinson, C. R. Incomes from farming and cost of apple production in the Shenandoah Valley, Frederick County, Va. Washington, 1927. 31 p. (U. S. Dept. agr. Dept. bul. 1455)

Table 13, p. 15: Labor and power used per farm in the operation of 48 orchard farms annually, 1916-1920, inclusive, and average for the period.

Table 20, p. 19: Organization of 48 orchard farms of different sizes and of different producing capacities - average for 1916-1920. Labor is included in the data given.

171. Swinson, C. R., and Funk, W. C. Economic aspects of citrus-fruit growing in Polk County, Fla. Washington, 1926. 40 p. (U. S. Dept. agr. Dept. bul. 1435)

"A study of the organization and cost of operating 100 citrus-fruit farms in Polk County, Fla., forms the basis of this bulletin. The investigation was carried on for six successive years, 1917 to 1922, inclusive."

Three tables on p. 15 show the following: amount of labor per acre in the care of 148 young citrus groves in Polk County, Fla.,

average 1919, 1920, and 1921; cost per acre, of labor and materials for the care of the same, average 1919-1921; and frequency of operations in the care of the same groves, average 1919-1921. Man and horse hours are both given.

Labor practices, by operations, on 100 groves in Polk County, Florida, averages for those performing operations in 1922, are shown in table 18, p. 24.

172. Taber, R. F., and Arnold, C. R. The labor required for crop production in Ohio; being a summary of data collected during the summer of 1921 in Perry, Trumbull, Seneca, and Mercer Counties, representing typical Ohio conditions. Columbus, 1922-23. 16 p. (Ohio. State univ. Agr. ext. serv. Bul. v. 18, no. 5, 1922-23)

"The material contained herein, showing methods and practices of doing farm work and the time necessary to perform different operations, should be of value mainly in the following ways; 1. To furnish standards of labor requirements that will enable the individual farmer to compare the efficiency of his own operations with the average for his section. 2. To give information to those interested as to the common practices in doing farm work in the various sections of the State. 3. To furnish data on the per acre requirement of man labor in the production of corn and wheat which should be of value to the individual farmer in arriving at his approximate production cost. 4. To furnish information on the normal accomplishment with tools of different sizes which should be of aid to the farmer in determining to what lengths he can profitably go in making changes in his equipment in order to increase the efficiency of his labor." -p.2.

173. Tapp, J. W., Collier, G. W., and Arnold, C. R. Farm practices under corn-borer conditions. Washington, 1928. 21 p. (U. S. Dept. agr. Farmers' bul. 1562)

Labor and power required by control practices: p. 8-14. Man and horse hours are given.

174. Tapp, J. W., and Grimes, W. E. More profit for the wheat farmers of central Kansas. Washington, 1924. 14 p. (U. S. Dept. agr. Farmers' bul. 1440)

"Greater efficiency in wheat growing": p. 2-7. Charts which are included in this section, show standard requirements for wheat production. Man, horse, and tractor hours are given for different farms.

175. Teske, A. H., and Gardner, V. R. Management methods in the raspberry plantation. East Lansing, 1927. 34 p. (Mich. Agr. exp. sta. Special bul. 165)

"The object of this investigation has been to study production methods and costs in Michigan and, if possible, to determine the relative importance of the main factors that make the raspberry plantation a success or a failure."

In "Descriptive accounts of three selected plantations", p. 26-30, man and horse hours required are included in the data given.

Table 10, p. 31: Plant production and yield records for four selected black raspberry plantations. Among data are man-hours used

in putting down tips and in digging and bunching in field.

176. Thomsen, F. L., and Thorne, G. B. Economics of strawberry production and marketing in Missouri. Columbia, 1928. 138 p. (Mo. Agr. exp. sta. Bul. 262)

Tables 4 and 5, p. 50 and 53, show costs of developing an acre of strawberries in southwest Missouri. Man labor and horse labor hours, also costs, are given for each operation.

177. Tolley, H. R., and Humphries, W. R. Tractors and horses in the winter wheat belt, Oklahoma, Kansas, Nebraska. Washington, 1924. 60 p. (U. S. Dept. agr. Bul. 1202)

"During August and September, 1921, the United States Department of Agriculture, in cooperation with the Kansas State Agricultural College and the College of Agriculture of the University of Nebraska, made a study of the use of power on 390 farms on which tractors were owned, in northern Oklahoma, Kansas, and Nebraska. A personal visit was made to each farm and the following data obtained: (1) Work done during year with tractor; (2) work done during year with horses; (3) cost of using tractor; (4) cost of keeping work stock; (5) changes in operation and organization of farm after purchase of tractor; (6) opinions and ideas concerning use of tractor."

178. Turlington, J. E., and Brunley, F. W. Preliminary report on labor and materials required for some Florida crops. Gainesville, Fla., College of agriculture, 1927. 16 p. (University record, published quarterly by the University of Florida, v. 22, no. 2, April, 1927) 31.3 T84

Table 1, p. 4, gives the "average number of hours per acre of man, horse, truck, and tractor labor for each of the important operations, as well as the total labor required per acre for each crop." Crops are fall beans, spring beans, cabbage, celery, corn, corn and peanuts, cotton, cucumbers, spring egg plant, cane, lettuce, fall pepper, potatoes, strawberries, tobacco, tomatoes, watermelons, and Spanish peanuts.

Table II, p. 6-7: Distribution of man and horse labor hours by half months and total hours of labor per acre for the various crops.

179. U. S. Dept. of agriculture. The wheat situation. A report to the President by Henry C. Wallace, Secretary of agriculture. Washington, Govt. print. off., 1923. 126 p. 1 Ag86W

This report is also published in the 1923 Agriculture Yearbook of the U. S. Dept. of Agriculture, p. 95-150, 646-661.

Table 63, p. 112, shows the hours of man and horse labor prior to harvest, and amount of seed wheat required per bushel of production in representative counties of high and low crop risk in Kansas, annually 1912-1923, both inclusive.

180. U. S. Dept. of agriculture. Bureau of agricultural economics. Costs and methods of fattening cattle in Illinois (winter 1922-23) 116 droves - 4742 head. Preliminary report. Washington, January, 1924. 14 p. Mimeographed. 1.9 F22C.

This is a "part of a five-year project conducted by the Bureau of Agricultural Economics and Bureau of Animal Industry, of the United States Department of Agriculture and the Department of Farm Organization and Management of the University of Illinois to determine the factors of cost in fattening cattle in the Corn Belt."

Other reports were issued in September, 1920, and January, 1923.

Table V, p. 6, shows average quantity of feed and other factors [man and horse hours] used in the production of 100 pounds of gain in corn-fed cattle.

Similar reports have been issued for Iowa, Missouri, and Nebraska.

181. U. S. Dept. of agriculture. Bureau of agricultural economics. Planning for low farm production costs; or, Conditions under which central Kentucky can compete with other areas in growing sheep and hogs and fattening beef cattle. Washington [1925?] 13 p. Mimeographed. 1.9 Ec762F1

This address was delivered by J. B. Hutson at Farmer's Week, University of Kentucky, January, 1925.

The following paragraph is quoted from p. 1: "There are some farmers in central Kentucky, who use on the average 400 man hours in growing 1,000 pounds of tobacco, and there are other farmers who produce 1,000 pounds of tobacco of just as good quality with 200 man hours. There are some farmers who use on the average 40 hours of man labor in growing a 40 bushel crop of corn and there are others who get 40 bushels of corn by using 20 hours of labor. There are some farmers who use on the average 20 hours of man labor in producing 15 bushels of wheat and other farmers get 15 bushels of wheat by using only 10 hours of labor. This suggests that costs vary, as individuals, farms, cropping systems and methods and practices vary."

182. U. S. Dept. of agriculture. Bureau of agricultural economics. Statistics of potatoes and sweet potatoes year ended July 31, 1924, with comparable data for earlier years. Washington, 1925. 51 p. (U. S. Dept. agr. Statistical bul. 10)

Table 7, p. 10-13, is "Normal Day's Work per 10-hour Day For Various Operations in Production" of potatoes.

Table 8, p. 13, gives a summary of basis acre requirements (461 farms), 1919, in Minnesota, Wisconsin, Michigan, New York, and Maine. Data include man and horse labor hours.

183. U. S. Tariff commission. Butter. Report...to the President of the United States. Investigation of the costs of production in the United States and in the principal competing foreign country of butter, with appendix. Washington, Govt. print. off., 1926. 143 p. 173 T17Bu

Detailed cost of production data for the domestic and the Danish butter industry are given on p. 89-118. A summary of butter production costs for principal producing sections in the United States, year May 1, 1923, to April 30, 1924, is given in table 35, p. 96-97. The table gives production per cow, and feed, pasture and labor per animal unit in the dairy herd.

In tables on p. 112-113 showing cost of producing butterfat and annual cost of maintenance and care of a dairy cow in Denmark, 168 hours of labor per cow are stated to be required.

184. U. S. Tariff Commission. Costs of producing sugar beets. Part I-IX United States. Summary of costs of production of sugar beets in the United States and an economic analysis of the sugar beet industry 1921, 1922, and 1923. Washington, United States Govt. print. off., 1923. 112 p. 173 T17Cs

Parts I-IX which deal with the individual states, Michigan, Ohio, Nebraska, Colorado, Utah, Idaho, Wyoming, Montana, and California should also be examined.

Pages 75-79 deal with labor costs and horse-labor costs, for the states and the United States. Man and horse hours per acre are given in addition to the rates per hour. Other tables are of interest.

185. Utah. Agricultural experiment station. Biennial report... for the years 1923 and 1924. Logan, 1925. 64 p. (Its Bul. 192)

Table showing cost of producing market strawberries, 1922, is given on p. 40. Man and horse hours are included in the data.

186. Vermont. University and state college of agriculture. Extension service. Cost of producing maple syrup and sugar on 52 Vermont farms in 1922, by H. P. Young. Burlington [1923] 7 p. Mimeographed. 275.2 V59Fa
A similar report for sixty Vermont farms in 1921 is by M. P. Rasmussen.

Data given include hours of human and horse labor per gallon, 1921 and 1922.

187. Vernon, J. J., and Ezekiel, M. J. B. Causes of profit or loss on Virginia tobacco farms. Blacksburg, 1925. 71 p. (Va. Agr. exp. sta. Bul. 241)

"This study was undertaken to give tobacco farmers of Virginia definite information as to why some farmers were making more satisfactory returns than were others, and to show from the results of the actual farm experience of a large number of tobacco farmers the most important ways in which they could improve the effectiveness of their farming and increase their income."

Tables 30 and 31, p. 37-38, show average months of labor per farm, with farms classified by size and acres in tobacco, Appomattox and Pittsylvania counties.

Tables 32 and 33, p. 38-39, show, for these same counties, farms classified by family labor resources and acres in tobacco.

188. Vernon, J. J., and others. Factors affecting returns from the dairy enterprise in the Shenandoah Valley. Blacksburg, 1927. 87 p. (Va. Agr. exp. sta. Bul. 257)
Table 40, p. 48, Average months of man labor used on dairy farms, according to the area in crops and number of dairy cows.
189. Wahlberg, H. E. Analyzing the cost of producing oranges. (In California Citrograph, v. 12, Aug. 1927, p. 346)
This is a progress report, read at Citrus Institute, Azusa, Calif.
Table I: Depreciation table for orange trees.
Table II: Average interest and depreciation per acre oranges.
Table III: Hours labor per acre.
Table IV: Labor and material cost per acre and per box.
Table V: Summary cost per acre and per box.
190. Walker, A. L., and Lantow, J. L. A preliminary study of 127 New Mexico ranches in 1925. State College, 1927. 107 p. (N. Mex. Agr. exp. sta. Bul. 159)
Bibliography: p. 107.
Labor requirements as based on type of ranch: p. 56-57.
191. Waller, A. G. Report of investigational work in agricultural economics. New Brunswick, 1924. (In N. J. Agr. exp. sta. Rept. 1922/23, p. 166-191)
Table 10, p. 167, shows cost of producing 8,893 capons on 66 Burlington County Farms, New Jersey. It includes the amount of labor spent on these capons according to operations.
"A full discussion of this table and the practice is given in New Jersey Agriculture for March, 1923."
192. Waller, A. G., and Swinson, C. R. A study of the production and marketing of peaches in New Jersey, made during the latter part of 1923 and the early part of 1924. [New Brunswick? 1924?] 103 p., charts. Typewritten. 280.3 W15
Copy in Library, U. S. Dept. of Agriculture.
"This report is a study of the margins obtained by all agencies used for bringing peaches to the consumer. It includes the cost of growing and intermediate handling margins. The cooperating agencies are the United States Department of Agriculture, (Bureau of Agricultural Economics) and the New Jersey State Agricultural Experiment Station... Nearly all the field records on cost of production were taken by C. R. Swinson of the U. S. D. A. The report is made up of two parts: Part I on Cost of production, by F. L. Manning, and Part II, on Marketing, by J. S. Hathcock."
Tables 10 and 11, p. 10 and 11, show hours used in farming and cultural practices for peaches. Table 16 in the section Brief Historical Resumé of the Apple and Peach Industry shows, among other details, hours of labor spent on apples per acre for various operations in the Hood River Valley. Data are taken from Oregon Agricultural Experiment Station Bulletin 181.

193. Waller, A. G., and Thompson, W. C. Poultry farming in New Jersey. New Brunswick, 1923. 31 p. (N. J. Agr. exp. sta. Circ. 153)
This is a "condensed, rearranged and slightly revised edition of Bulletin 329 of the New Jersey Agricultural Experiment Station."
Numerous statistical tables are given. Among the data are months of labor and cost of labor per 100 birds. Table 9, p. 25, gives among other data, quantity and value per bird of human and horse labor.
Item 33 in the summary on p. 27 states that "An average of 1.7 months' labor was required to care for 100 mature birds and chickens raised per 100 mature birds per year."
194. Waller, A. G., and Weiss, H. B. Cost, profits, and practices of the sweet potato industry in New Jersey, 1922. Trenton, 1923. 55 p. (N. J. Dept. agr. Circ. 70)
Table X, p. 32, gives labor requirements (man and horse) in hours of producing sweet potatoes per acre in seven New Jersey counties. Average man, horse, and truck hours are also given.
195. Waller, A. G., and Weiss, H. B. Costs and practices of growing alfalfa in New Jersey. Trenton, 1925. 35 p. (N. J. Dept. agr. Circ. 84)
Contains numerous tables. Tables VIII-XI, p. 27-32, deal particularly with labor distribution. Man, horse, and tractor or truck hours per acre by operations are given.
196. Waller, A. G., and Weiss, H. B. The peach industry in New Jersey; a statistical and economic study. New Brunswick, 1927. 39 p. (N. J. Agr. exp. sta. Bul. 452)
"Cost of developing an acre of peaches": p. 32-35. Table 29, p. 34, shows number of trees, amount of man, horse, and tractor labor, and fertilizer and spray material used in developing a peach orchard in certain sections of Georgia, South Carolina, North Carolina, Tennessee, Virginia, Pennsylvania, Maryland, New Jersey, Illinois, and New York. Tractor hours are not given for all sections.
197. Warren, G. F., and others. Cost accounts for six years on some successful New York farms. Ithaca, 1923. 139 p. (N. Y. Cornell, Agr. exp. sta. Bul. 414)
"The main topics reported upon here are the development of the work, the education and experience of farm operators, the character of the farms, methods used, capital invested, profits, human labor, horse labor, equipment, real estate costs, general expenses, manure, lime, dairy cattle, poultry, hogs, sheep, the cost of producing crops, and averages for the seven years 1914 to 1920, for which the accounts obtain." -Experiment Station Record, v. 49, p. 690.
Labor: p. 30-62.
Crops for which human labor and horse labor are given are: alfalfa, barley, field beans, buckwheat, cabbage, corn for grain, corn for silage, hay, mangels for stock feed, oats, peaches, pears, potatoes, rye, and wheat. There are also tables showing distribution of direct and indirect human labor for horses, cattle, hogs, poultry, sheep, bees, apples, cucumbers, gardens, onions, peas for market, canning-

factory peas, sweet corn, tobacco, market tomatoes, maple sirup, and the other crops already mentioned.

198. Washburn, R. S. Cost of producing winter wheat in central Great Plains region of the United States. Washington, 1924. 36 p. (U. S. Dept. agr. Dept. bul. 1198)

Labor and power requirements: p. 5-10. Man, horse, and tractor requirements per acre are given for 1920.

"Use of quantity requirements of labor and materials in computing costs": p. 29-30.

Summary of labor practices, 1920, in certain counties of Missouri, Kansas, Oklahoma, and Nevada: p. 30-35.

199. Washburn, R. S. Hay-harvesting cost much reduced with up-to-date machinery. (In U. S. Dept. agr. Yearbook of agriculture, 1927, p. 356-358)

"Wide variations in the efficiency of hay production are found on individual farms in the eastern United States. Some farmers harvest and store an acre of hay with four hours of labor, whereas on other farms more than eight hours of labor are required. [Data from studies of the cost of producing hay in Pennsylvania on file in the Division of Farm Management and Costs, Bureau of Agricultural Economics, U. S. Department of Agriculture] Evidently many farmers can improve their efficiency through improved methods in harvesting and storing hay...

"The use of a side-delivery rake and hay loader effected a saving of approximately one and one-half hours per acre of man labor and one-half hour per acre of horse work as compared with the dump rake and hand loading from windrow."

200. Washburn, R. S., and Scudder, H. D. Cost of producing winter wheat and incomes from wheat farming in Sherman County, Oreg. Washington, 1927. 40 p. (U. S. Dept. agr. Dept. bul. 1446)

"Based on data on the cost of the factors of production and farm earnings obtained by personal interviews, 450 records being obtained, divided nearly equally among the years 1920, 1921, and 1922. The area studied is dry-farmed, approximately 36 per cent of the average acreage per farm in 1922 being in winter wheat, 39 in summer-fallow, 4 in other crops, 19 in pasture, and 2 per cent in waste land. So far as possible the data were reported in terms of physical requirements. The quantity requirements of labor and materials were analyzed and the effect of the differences in methods and practices on costs and returns were measured...the cost and utilization of man labor, horse work, farm machinery, and their relation to the size of farm... are discussed...

"Itemized estimates are included on the cost of production for 1923 and 1924, and suggested plans for the organization and management are given for a 640-acre farm, a 1,280-acre farm operated with horses, and a 1,280-acre farm operated with tractors." -Experiment Station Record, v. 56, p. 785.

201. Washburn, R. S., and Scudder, H. D. Cost of using horses, tractors, and combines on wheat farms in Sherman County, Oreg. Washington, 1926. 44 p. (U. S. Dept. agr. Dept. bul. 1447)
"The purpose of this study, which is based on data in Dept. Bulletin 1446, is to show the probable costs of using combines, horses, and tractors and to present the important points to be considered in the selection of combines and motive power... The kinds, amounts, costs, economy, efficiency, seasonal distribution, advantages and disadvantages, etc., of horse and tractor work, and the types of, and the cost and the advantages and disadvantages of using combines are discussed." -Experiment Station Record, v. 56, p. 785.
202. Weaver, F. P., and Washburn, R. S. Farm adjustments in market hay areas of Pennsylvania. State College, 1928. 19 p. (Penn. Agr. exp. sta. Bul. 223)
"The purpose of this study is to find out what changes farmers have made in their farming and marketing practices during the period of the relative decline in hay prices since the advent of the automobile, the truck, the tractor, and the electric motor." p. 3.
Table 13, p. 16, shows man labor and horse work requirements for making and storing hay.
Table 14, p. 16, shows time required per ton for loading and unloading hay by different methods.
Table 15, p. 17, is Cost of Baling Hay on Pennsylvania Hay Farms.
203. Westbrook, E. C. Hay production in Georgia, Labor and material requirement. Athens, 1924. 20 p. (Ga. State col. agr. Bulletin v. 13, no. 3, July, 1924. Whole no. 300)
"The study of the amount and distribution of labor and the material requirement of hay presented in this bulletin is based on a survey of 118 farms in eleven counties, of which four were in southwest Georgia, six in north Georgia and one in middle Georgia. Data were obtained on the 1922 crop. An analysis of the man labor and mule labor, the material requirement, yield, and price, was made and the relation of these factors to each other determined for six types of hay." Kinds of hay for which data are given are peavine, peas and sorghum, soy beans, alfalfa, meadow, and Johnson grass.
204. Westbrook, E. C., and others. An economic study of farm organization in Sumter County. Athens, 1927. 89 p. (Ga. State col. agr. Bul. v. 16, December, 1927. Whole no. 324)
Table 51, p. 87, shows boll weevil control methods practiced by 97 cotton growers in Sumter County, Georgia, in 1924. Hours required to cover one acre each with a horse duster and a hand duster are included in the data.
205. Wilcox, R. H., and others. Costs and methods of fattening beef cattle in the Corn Belt, 1919-1923. Washington, 1927. 114 p. (U. S. Dept. agr. Tech. bul. 23)

"This bulletin contains information concerning the costs of fattening beef cattle in five representative feeding districts of the Corn Belt and shows the influence of different methods and practices upon costs and returns. The study was begun in the fall of 1918 and was continued during five consecutive feeding seasons. The districts chosen for study were located in eastern Nebraska, southwestern Iowa, west-central Missouri, northern Illinois, and various counties of central and northern Indiana." p. 1.

Table 6, p. 15-16, shows, among other items, quantities of feed and man and horse labor used in certain districts of Nebraska, Iowa, Illinois, Indiana, and Missouri, annually 1919-1923, with total or average for each state.

Table 19, p. 44: Basic requirements of feed and labor and feed-lot by-products in making 100 pounds of gain on cattle of various weights, 1919-1923.

Tables 43-47, p. 67-81: Basic requirements (including man and horse labor), costs, and financial returns in fattening beef cattle in the states studied, annually, 1919-1923.

206. Wilcox, R. H., and others. Factors in the cost of producing beef in the Flint Hills section of Kansas. Washington, 1926. 27 p. (U. S. Dept. agr. Dept. bul. 1454)

Gains and pasture and labor requirements of production: p. 9-12. Includes a table (no. 2) which shows gain, pasture, and man and horse labor requirements of cattle grazed on pastures in Chase County, Kans., in 1921, 1922, and 1923.

Table 7, p. 20, shows gain, pasture, and labor requirements for steers fed on grass in Chase County, Kans., in 1921, 1922, and 1923.

Table 9, p. 24, shows gains, daily feed costs, and labor requirements per head of steers wintered in Chase County, Kans., in 1921-22 and 1922-23.

207. Wilkinson, A. E. Tomatoes, Storrs, 1928. 22p. (Conn. Agr. Col. Ext. serv. Ext. bul. 120)

A table on p. 21 gives detailed costs of producing tomatoes on 3 different farms. Total man and horse labor are given for each.

208. Willard, R. E. Farm costs and farm organization. Agricultural College, 1923. 8 p. (N. Dak. Agr. col. Agr. ext. div. Circ. 57)

Labor (man and horse) requirements for production of crops: p. 4-5. Crops are rye, potatoes, corn for silage, corn for silo filling, wheat, oats, barley, and flax. Requirements are also given for cattle and sheep.

209. Willard, R. E., Metzger, Hutzler, and Thorfinnson, T. S. Cost of production and farm organization on 126 farms in North Dakota, 1921 and other economic data. Agricultural College, 1922. 129 p. (N. Dak. Agr. exp. sta. Bul. 165)

Labor and power requirements, 126 farms, 1921: p. 71-75. These pages include Table 53, which gives number of farms, man hours, horse hours, tractor hours, seed twine, and yield per acre for

wheat, oats, barley, rye, flax, potatoes, corn fodder, corn grain, corn silage, silo filling, and summer fallow; and Table 54 which gives labor and power requirements per farm.

Table 56, p. 78: Labor and feed requirements and costs of keeping sheep.

Table 57, p. 80: Feed, labor and other requirements per animal unit of cattle.

210. Wilson, M. L., and others. A study of ranch organization and methods of range-cattle production in the northern Great Plains region. Washington, 1928. 92 p. (U. S. Dept. agr. Tech. bul. 45)

"Contains information concerning the adaptation of the northern Great Plains region for range-cattle production and methods of management and systems of ranch organization best suited to the region...

"Tables are given showing for ranches grouped according to the number of cows...the acreage of farming and grazing land, by tenure; ranches using grazing land; size of ranch...amounts and kinds of labor...

"Standard organizations are given for a 50-, 200-, and 500-cow ranch, and a 1000-steer ranch, showing the organization, distribution of capital, operation, feed and labor requirements, and estimated production, receipts, expenses, and income." -Experiment Station Record, v. 59, p. 181-182.

211. Woodworth, H. C. Dairy farm management in New Hampshire. Durham, 1923. 31 p. (N. H. Col. agr. and mechanic arts. Ext. serv. Ext. bul. 20)

Man labor hours per cow and per cwt. of milk are included in data given. Two charts on p. 15 show distribution of labor in making 50 acres of native hay; 12 acres of alfalfa, 3 cuttings; 13 acres of clover hay, 2 cuttings; and 25 acres of native hay, 85 tons.

212. Woodworth, H. C., and Abell, M. F. Silo filling with less labor. Durham, 1928. 4 p. (N. H. Col. agr. and mechanic arts. Ext. serv. Ext. circ. 80)

Gives suggestions as to how silos may be filled with less man labor. Data obtained in a field survey in the fall of 1926 of silo-filling operations are given.

213. Young, E. C., and Hobson, L. G. Costs and profits in producing soybeans in Indiana. Lafayette, 1926. 28 p. (Ind. Agr. exp. sta. Bul. 306)

"The average labor required for growing and marketing soybeans for grain was man labor 15.6 hours, horse labor 26.3 hours, and tractor work 1.7 hours; and for growing and storing soy bean hay, man labor 15.7 hours, horse labor 28 hours, and tractor work 1 hour.

"Tables are given showing unit costs and the distribution of man, horse, and tractor work by 10-day periods throughout the season." -Experiment Station Record, v. 57, p. 383.

214. Young, H. P. Studies in Vermont dairy farming. -III, Randolph-Royalton area. Burlington, 1927. 64 p. (Vt. Agr. exp. sta. Bul. 268)

Table 15, p. 18: Young dairy cattle: debits and credits. Man and horse labor hours are included.

Table 16, p. 19: Average cost of keeping a horse. Man labor hours are included.

Table 37, p. 36: Relation of labor efficiency to labor income.

Table 44, p. 42: Milk production costs, 186 farms. Man and horse labor hours are given.

Table 46, p. 43: Human labor used in connection with dairy enterprise.

Table 48, p. 44: Costs and returns per 100 pounds of milk. Human labor and horse labor hours included.

Tables 56 and 57, p. 53: Saving in labor due in part to milking machines; The effect of milking machines on cost of producing milk in herds of over 14.5 cows.

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3. Experiment station record, v. 48, 1923-v. 60, no. 2, 1929.
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9. Wright, Muriel F., comp. Farm machinery and farm labor in the United States. Selected list of references on the replacement of labor by machinery on the farm since 1921. Library, U. S. Bureau of Agricultural Economics, Jan. 30, 1928. 6 p. Typewritten.
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INDEX

Item		Item	
Abell, M. F.....	128,212	Arkansas. College of agriculture...	105
Adams, R. L.....	1-4	Arnold, C. R.....	172-173
Alabama. College of agriculture.....	105	Asparagus, South Carolina.....	156
Alfalfa.....	87,142	Atkins, S. W.....	5
Arkansas.....	109		
Colorado.....	125	Baker, G. O.....	160
Georgia.....	43,203	Ball, C. R.....	7
Idaho.....	64	Barley.....	
Illinois.....	67-71	Colorado.....	125
Kansas.....	52	Illinois.....	69-70
Minnesota.....	143-144	Iowa.....	72
New Hampshire.....	211	Minnesota.....	143-144
New Jersey.....	195	New York.....	197
New Mexico.....	55	North Dakota.....	208-209
New York.....	197	South Dakota.....	8,10-12,163
North Dakota.....	94	Virginia.....	96
South Carolina.....	75,155	Washington.....	76
South Dakota.....	8,10-11,163	Wisconsin.....	110,112
Texas.....	55	Beans.....	
Virginia.....	42	Colorado.....	125
Washington.....	76,161	Florida.....	178
Wisconsin.....	110,112	Idaho.....	64
Allen, J. R.....	101	North Dakota.....	94
Allred, C. E.....	5	South Carolina.....	75
Almonds.....		Virginia.....	18
California.....	1	Beans, field.....	
Alsike clover seed.....		California.....	54
Idaho.....	64	Colorado.....	54
American society for horticultural		Idaho.....	54
science.....	17	Michigan.....	54
American society of agricultural		New Mexico.....	54
engineers.....	107	New York.....	54,197
App, Frank.....	6	Vermont.....	59
Apples.....	123	Wisconsin.....	54
Arkansas.....	109	<u>See also</u> Velvet beans.....	
Kentucky.....	130	Beans, string.....	
Minnesota.....	17	South Carolina.....	75,155
New Hampshire.....	128	Beans, velvet.....	
New York.....	34,95,159,164,197	<u>See</u> Velvet beans.....	
Oregon.....	192	Beef.....	
Tennessee.....	5	Illinois.....	68,71
Vermont.....	59	Bees.....	
Virginia.....	170	New York.....	197
Washington.....	161,164	Beets.....	
Arkansas. Agricultural experiment		North Dakota.....	94
station.....	15-16,28	<u>See also</u> Sugar beets.....	

	<u>Item</u>
Benedict, R.....	8
Bennett, M. K.....	9
Bermuda hay	
Arkansas.....	109
Berries	
Kentucky.....	130
Vermont.....	59
<u>See also</u> names of kinds of	
berries.	
Bigelow, Edna.....	25
Blackberries	
Arkansas.....	109
Washington.....	77
Bluegrass	
Kentucky.....	130
Boll weevil control	
Georgia.....	204
Bonnen, C. A.....	10-12, 70-71, 148
Boyd, G. R.....	13
Brandes, E. W.....	14
Brannen, C. O.....	15-16
Brierley, W. G.....	17
Brightman, M. H.....	138
Brodell, A. P.....	18-23
Brumley, F. W.....	178
Brush and stumps	
Minnesota.....	13
Buckwheat	
New York.....	7, 197
Pennsylvania.....	7
West Virginia.....	36
Bulls.	
New York.....	120
Ohio.....	126
Vermont.....	59
Wisconsin.....	110
Burdick, R. T.....	24-27, 125
Butterfat	
Kansas.....	52
Oregon.....	53
South Dakota.....	8
Vermont.....	61
Byrd, H. A.....	99
Cabbage.....	123
Colorado.....	125
Florida.....	178
New Mexico.....	55
New York.....	114, 197

	<u>Item</u>
Cabbage - Continued	
South Carolina.....	75, 155
Texas.....	55
California. Agricultural experi-	
ment station.....	1-4
Calves	
Colorado.....	93
New York.....	120
Vermont.....	59
Wisconsin.....	110
Campbell, C. E.....	28
Cane	
Florida.....	178
<u>See also</u> Sorghum cane;	
Sugar cane.	
Cane hay	
South Carolina.....	75
Cantaloupes	
Georgia.....	63
New Mexico.....	55
Texas.....	55
Washington.....	161
Capons	
New Jersey.....	191
Case, H. C. M.....	29, 70-71
Cattle.....	87, 165
California.....	89
Colorado.....	24, 26-27, 88-93, 125
Idaho.....	88-89
Illinois.....	70-71, 180
Iowa.....	62, 180
Kansas.....	51-52
Kentucky.....	130
Minnesota.....	144
Missouri.....	180
Montana.....	88-89
Nebraska.....	56, 180
New Mexico.....	190
New York.....	197
North Carolina.....	158
North Dakota.....	208-209
Northern Great Plains.....	210
Oregon.....	89
South Dakota.....	8, 10-11, 89
Texas.....	136-137
Utah.....	88-89, 140
Washington.....	89
Wyoming.....	88-89
Wisconsin.....	120
<u>See also</u> Bulls; Calves; Steers.	

	Item
Cattle, beef.....	123
California.....	4
Illinois.....	205
Indiana.....	205
Iowa.....	205
Kansas.....	51, 205
Kentucky.....	130
Missouri.....	205
Nebraska.....	205
Tennessee.....	5
Virginia.....	96
Cattle, dairy.....	87, 97, 123, 165, 183
Denmark.....	183
Illinois.....	68
Kentucky.....	130
Minnesota.....	143-144
Mississippi.....	99, 101-104
New Hampshire.....	211
New York.....	119-120
North Carolina.....	131, 158
Ohio.....	126, 134
Oregon.....	53
Pennsylvania.....	41
South Carolina.....	75, 155
South Dakota.....	10-12
Tennessee.....	5
Vermont.....	59, 61, 214
Virginia.....	96, 188
Washington.....	160
Wisconsin.....	110
<u>See also Heifers</u>	
Celery	
Florida.....	178
Cherries	
Arkansas.....	109
Citrus groves	
Florida.....	171
Clover.....	142
Arkansas.....	109
Illinois.....	67-71, 149
New Hampshire.....	211
South Dakota.....	10-11
Virginia.....	18, 42
Wisconsin.....	112
Clover seed	
Idaho.....	64
Illinois.....	70
South Dakota.....	10
<u>See also Alsike clover seed</u>	

	Item
Collier, G. W.....	58, 173
Collingwood, G. H.....	30
Colorado. Agricultural college.	
Dept. of economics and sociology.....	25
Colorado. Agricultural experiment station.....	24, 26-27, 88-93, 125, 141
Colts	
Minnesota.....	143
Connecticut. Agricultural college.	
Agricultural extension service..	207
Connecticut (Storrs) Agricultural experiment station.....	31
Cooper, M. R.....	22, 32
Cope, J. A.....	30
Corbett, L. C.....	33
Corbett, R. B.....	34
Corn.....	6, 21, 87, 123
Arkansas.....	109
Florida.....	178
Georgia.....	63, 151
Illinois.....	67-71, 149
Iowa.....	72
Kansas.....	52, 82
Kentucky.....	66, 84, 130, 181
Louisiana.....	85
Minnesota.....	143-144
Mississippi.....	99, 101-104
Missouri.....	121
New Mexico.....	55
New York.....	197
North Carolina.....	46-47, 158
North Dakota.....	94, 152, 209
Ohio.....	44-45, 107, 127, 133, 172
Pennsylvania.....	80
South Carolina.....	74-75, 155-156
South Dakota.....	8, 10-12, 152, 163
Tennessee.....	5
Texas.....	55
Vermont.....	59
Virginia.....	18, 96
Washington.....	76, 161
West Virginia.....	36
Wisconsin.....	110, 112
Corn, sweet	
New York.....	197
Vermont.....	59
Corn borer control.....	173

	Item		Item
Corn for silo filling		Dadisman, A. J.....	36
North Dakota.....	208-209	Dairy crops	
Corn land		California.....	3
Michigan.....	58	Dallas (Texas) morning news.....	37
Corn silage.....	87,123	Dalrymple, W. H.....	85
Kansas.....	81	Dickey, J. A.....	16
Kentucky.....	130	Dowler, J. F.....	38,45
Minnesota.....	143-144	Eggplant	
New York.....	197	Florida.....	178
North Dakota.....	94,208-209	Eggs	
Tennessee.....	5	See Poultry and eggs.	
Vermont.....	59	Ellis, L. S.....	110
Virginia.....	96	Emmer	
Washington.....	76	South Dakota.....	11
Wisconsin.....	110,112	Erwin, A. T.....	39
Cornell university. State college		Esplin, A. C.....	40
of agriculture. Dept. of		Ezekiel, M. J. B.....	41-42,187
agricultural economics and farm		Fain, J. R.....	43
management..	34-35,95,116,147,150,159	Falconer, J. I.....	44-45
Cornell university. New York state		Fallow, summer	
college of agriculture. Extension		North Dakota.....	209
service.....	30,164	Field crops	
Cotton.....	21,87,123	California.....	3
Alabama.....	105	See also names of kinds of	
Arkansas.....	105,109	field crops.	
Florida.....	178	Finn, W. G.....	66
Georgia.....	63,105,151,204	Flax	
Mississippi.....	99,101-105	Minnesota.....	7,144
New Mexico.....	55	North Dakota.....	7,94,208-209
North Carolina.....	47,105	South Dakota.....	8,11-12,163
Oklahoma.....	20,22,105	Florida. Agricultural experiment	
South Carolina.....	74-75,105,155-156	station.....	108
Texas.....	20,22,37,49,55,105	Florida. University.....	179
Cowpea hay		Food research institute.....	9
South Carolina.....	156	Forster, G. W.....	46-47
Cowpeas.....	87	Frame, B. H.....	78,121
Arkansas.....	109	Fruit.....	87
Georgia.....	63,151	See also names of kinds of	
Illinois.....	67,149	fruit.	
Kentucky.....	130	Funk, W. C.....	48,171
Louisiana.....	85	Gabbard, L. P.....	49
Tennessee.....	52	Galloway, Z. L.....	130
Cows		Gardens	
See Cattle, dairy.		Kentucky.....	130
Cucumbers			
Arkansas.....	109		
Florida.....	178		
New York.....	197		

<u>Item</u>	
Gardens - Continued	
Mississippi.....	101
Missouri.....	122
New York.....	197
South Carolina.....	75
Tennessee.....	5
Gardner, V. R.....	175
Garner, W. W.....	50
Georgia. State college of agriculture.....	43,63,105,203-204
Goodell, C. J.....	100
Grain for hay	
Vermont.....	59
Grains, small	
Iowa.....	72
Minnesota.....	143
Texas.....	162
Vermont.....	59
See also names of kinds of grains.	
Grapes	
Arkansas.....	109
Kentucky.....	130
See also Vineyards.	
Grimes, W. E.....	51-52,174
Gunn, R. V.....	53,58
Hardenburg, E. V.....	54
Harriott, J. K.....	150
Harter, W. L.....	39
Hartman, W. A.....	111
Hathcock, J. S.....	192
Hauter, L. H.....	55
Hay.....	21,142
Illinois.....	67-71,149
Intermountain regions.....	153
Kentucky.....	66
Minnesota.....	143-144
Mississippi.....	101
New Hampshire.....	211
New York.....	197
North Carolina.....	158
Northern Great Plains.....	153
Pennsylvania.....	80,199,202
South Carolina.....	74
South Dakota.....	8,10-12,163
Tennessee.....	5
Vermont.....	59
Virginia.....	96

<u>Item</u>	
Hay - Continued	
Wisconsin.....	110,112
See also names of kinds of hay.	
Hedges, Harold.....	56
Heifers	
New York.....	119-120
Vermont.....	59
Wisconsin.....	110
Hester, E. D.....	57
Hill, E. B.....	58
Hitchcock, J. A.....	58a-59
Hobson, L. G.....	213
Hodgson, R. W.....	60
Hog grazing crops	
Georgia.....	63
Hogs	
See Swine	
Hooker, P. K.....	61
Hopkins, J. A. jr.....	62
Horses.....	87,165
California.....	3
Illinois.....	69-71
Kansas.....	52,82,177
Kentucky.....	130
Minnesota.....	143-144
Nebraska.....	177
New York.....	197
Oklahoma.....	177
South Dakota.....	10-12
Tennessee.....	5
Vermont.....	214
Wisconsin.....	110
See also Colts	
Humphries, W. R.....	86,177
Hungerford, DeF.....	63
Hunter, Byron.....	64
Hutson, J. B.....	11,47,65-66,96,125,181
Idaho. State college of agricul- ture.....	32
Illinois. Agricultural experiment station.....	29,67-69,148-149
Illinois. University. College of agriculture. Department of farm organization and management...	70-71,180
Indiana. Agricultural experiment station.....	135,213

Item	Item
Iowa. Agricultural experiment station.....39,62,115	Livestock - Continued
Iowa. State college. Dept. of agricultural economics and farm management.....167	North Carolina.....46-47
Iowa county cost route.....72	Virginia.....18,96
	Washington.....76
Jamison, N. G.....53	See also names of kinds of livestock.
Jensen, W. G.....73-75,155	Loganberries
Jett, C. U.....130	Washington.....77
Johnson, E. R.....35,76	Long, L. E.....101-105
Johnson, M. B.....152	Louisiana. Agricultural experiment station.....85
Johnson, N. W.....77,161	
Johnson, O. R.....78,121-122	McCollam, M. E.....106
Johnson grass hay	McCuen, G. W.....107
Georgia.....43,203	McKinley, Bruce.....108
Jones, F. R.....49	McNair, A. D.....109
Jones, M. D.....79	McNall, P. E.....110-112
Josephson, H. B.....80,139	Maine. University.....79
	Mangels
Kansas. Agricultural experiment station.....51,81-82,154	New York.....197
Kansas. State Agricultural college.....177	Western Washington.....106
Kaupp, B. F.....83	Manning, F. L.....192
Kentucky. Agricultural experiment station.....65-66,84,129-130	Maple sirup
Kidder, A. F.....85	New York.....30,147,197
Kifer, R. S.....86,102,112	Vermont.....30,58a,147,186
Kinsman, C. D.....87,153	Maple sugar
Klemmedson, G. S.....26-27,88-93,136-137	Vermont.....59
Koppen, W. J.....17	Marble, D. R.....35
Kuenning, A. C.....94	Martin, J. H.....86,113
	Mason, C. R.....114
La Mont, T. E.....95,159	Massachusetts. Agricultural experiment station.....118
Langsford, E. L.....96	Matthews, C. A.....115
Lantow, J. L.....190	Meadow grass hay
Larson, C. W.....97	Georgia.....43,203
Lemons	Kentucky.....130
California.....60	Meal, W. G.....116
Lescohier, D. D.....98	Melons
Lespedeza hay	Kentucky.....130
Arkansas.....109	South Carolina.....75
Mississippi.....99,102-103	See also Cantaloupes; Musk-melons; Watermelons.
Lettuce	Mendum, S. W.....117
Florida.....178	Metzger, Hutzal.....209
Lindgren, H. A.....146	Michigan. Agricultural experiment station.....58,175
Lipscomb, J. N.....99-100	Mighell, R. L.....118
Livestock	Milk.....123
Colorado.....125	California.....2

<u>Item</u>	<u>Item</u>
Milk - Continued	New Jersey. Agricultural experi-
Delaware.....97	ment station.....191-193,196
Indiana.....97	New Jersey. Dept. of agricul-
Louisiana.....97	ture.....194-195
Nebraska.....97	New Mexico. Agricultural experi-
Ohio.....126,134	ment station.....190
Oregon.....53	New Mexico. College of agricul-
New Hampshire.....211	ture and mechanic arts. Agri-
South Carolina.....155	cultural extension service.....55
Vermont.....97,214	New York. Cornell. Agricultural
Washington.....97,160	experiment station.....119-120,197
Wisconsin.....117	Nicholls, W. D.....129-130
Milking	North Carolina. Agricultural
Iowa.....115	experiment station....46,83,131,158
Millet hay	North Carolina. State college of
South Dakota.....10	agriculture.....47,105,208
Millet seed	North Dakota. Agricultural experi-
South Dakota.....10	ment station.....94,209
Minnesota. Agricultural experiment	Nuckols, S. B.....64,76
station.....17,143-144	
Misner, E. G.....35,119-120	Oat hay
Mississippi. Agricultural and	Illinois.....69-70
mechanical college.....105	North Carolina.....46
Mississippi. Agricultural experiment	Virginia.....13
station.....99-104	Oats
Missouri. Agricultural experiment	Arkansas.....109
station.....78,121-122,176	Colorado.....125
Mitchell, D. R.....112	Georgia.....63
Moburg, E. R.....167	Illinois.....67-71,148-149
Molasses	Indiana.....135
See Sorghum molasses	Iowa.....72
Montana. Agricultural experiment	Kansas.....52,81
station.....154	Kentucky.....130
Montana. State college of	Minnesota.....7,143-144
agricultural and mechanic arts....86	Mississippi.....99,102-104
Moorhouse, L. A.....123-125	Missouri.....121
Morison, F. L.....126	New York.....197
Mules	North Dakota.....7,208-209
South Carolina.....75	Ohio.....45
Muskmelons	Pennsylvania.....80
Arkansas.....109	South Carolina.....74-75,155-156
Myers, K. H.....127	South Dakota.....8,10-12,163
	Tennessee.....5
Nebraska. Agricultural experiment	Virginia.....96
station.....56,154	Washington.....76
Nebraska. University. College	West Virginia.....36
of agriculture.....86,177	Wisconsin.....110,112
New Hampshire. Agricultural	Ohio. Agricultural experiment
experiment station.....128	station.....38,44-45,126,132-133
New Hampshire. College of agricul-	Ohio. State university.....107
ture and mechanic arts. Exten-	
sion service.....211-212	

Item	Item
Ohio. State university. Agricultural extension service.....172	Pears
Ohio. State university. College of agriculture and domestic science.....127,134	Arkansas.....109
Oklahoma. Agricultural and mechanical college.....22,86,105	New York.....197
Oklahoma. Agricultural experiment station.....154	Peas
Oliver, A. W.....146	Colorado.....125
Onions.....123	Idaho.....32
Iowa.....39	New York.....197
New York.....116,197	North Carolina.....46
South Carolina.....75	North Dakota.....94
Oranges	Virginia.....18
California.....60,189	Washington.....32
Orchards	Wisconsin.....110
California.....3	Peas, canning.....123
Missouri.....122	Maine.....79
South Carolina.....75	New York.....197
Oregon Agricultural college.	Wisconsin.....112
Extension service.....53	Peavine hay
Oregon. Agricultural experiment station.....145-146,192	Georgia.....43,203
Overton, M. H.....135	Pennsylvania. Agricultural experiment station.....80,138-139,202
Parr, V. V.....93,136-137	Pennsylvania. Dept. of agriculture.....114
Peaches	Pepper
Arkansas.....15,23,109	Florida.....178
Colorado.....23	Peterson, William.....140
Georgia.....23,196	Pingrey, H. B.....141
Illinois.....23,196	Piper, C. V.....142
Maryland.....23,196	Ploughing
Michigan.....23	New York.....150
New Jersey.....23,192,196	Pond, G. A.....17,143-144
New York.....23,34,196-197	Pork
North Carolina.....23,196	Illinois.....29,68,70-71,168
Pennsylvania.....23,196	Indiana.....169
South Carolina.....23,73,155-156,196	Iowa.....167-168
Texas.....23	Louisiana.....85
Tennessee.....23,196	Minnesota.....143
Virginia.....23,196	Mississippi.....99,101,103-104
Utah.....23	Ohio.....38,132
West Virginia.....23	Oregon.....146
Peanuts	South Dakota.....8,10-11
Arkansas.....109	Virginia.....96
Florida.....178	Wisconsin.....110
Georgia.....63,151	Potatoes.....21,33,87,123
Kentucky.....130	Arkansas.....109
North Carolina.....46	Colorado.....125
	Florida.....108,178
	Idaho.....64
	Maine.....48,182
	Massachusetts.....118

<u>Item</u>		<u>Item</u>	
Potatoes - Continued		Reinholt, Martin.....	26-27, 91-93
Minnesota.....	48, 182	Reynolds, H. W.....	103-104
Michigan.....	48, 182	Reynoldson, L. A.....	151-154
New Hampshire.....	128	Rice.....	87
New York.....	48, 182, 197	Arkansas.....	109
North Carolina.....	46	China.....	57
North Dakota.....	94, 208-209	Japan.....	57
Pennsylvania.....	80, 139	Philippine Islands.....	57, 157
South Carolina.....	75, 155	Robinson, F. H.....	155
South Dakota.....	8, 10-11, 163	Rogers, R. H.....	12
Vermont.....	59	Ross, R. C.....	29, 149
Washington.....	76, 161	Russell, B. A.....	156
West Virginia.....	36	Rutabagas	
Wisconsin.....	48, 112, 182	Washington.....	76
Potter, E. L.....	145-146	Rye	
Poultry and eggs.....	87, 165	Georgia.....	151
Illinois.....	68, 70-71	Illinois.....	67, 71, 149
Kansas.....	52	Kentucky.....	130
Kentucky.....	130	Minnesota.....	144
Minnesota.....	143-144	New York.....	197
Mississippi.....	99, 101-104	North Carolina.....	158
Missouri.....	78	North Dakota.....	208-209
New Jersey.....	193	South Carolina.....	75
New York.....	35, 197	South Dakota.....	8, 11, 163
North Carolina.....	83, 158	Tennessee.....	5
Ohio.....	38, 126, 133	Rye cover crops	
Pennsylvania.....	138	Virginia.....	96
South Carolina.....	155	Rye hay	
South Dakota.....	8, 10-12	Kentucky.....	130
Tennessee.....	5	Rye pasture	
Vermont.....	59	Kentucky.....	130
Virginia.....	96	North Carolina.....	46-47
Wisconsin.....	110		
See also Capons		Sacay, F. M.....	157
Prairie grass		Saville, R. J.....	46-47, 158
Kansas.....	52	Schoffelmayer, Victor H.....	37
Purdue university. Depts. of farm		Scoville, G. P.....	159
management and animal industry...	169	Scudder, H. D.....	200-201
Quaintance.....	33	Seed	
Radishes		Missouri.....	122
Arkansas.....	109	See also names of kinds of	
Raspberries		seed.	
Michigan.....	175	Seed bed preparations	
Washington.....	77	South Dakota.....	11-12
Rasmussen, M. P.....	30, 147, 186	Severance, George.....	77, 160-161
Rauchenstein, Emil.....	148-149	Shaw, J. M.....	115
Redtop		Shawl, R. I.....	68
Illinois.....	67, 149	Sheep.....	165
Reid, R. D.....	150	Colorado.....	25, 125

	Item
Sheep - Continued:	
Illinois.....	70-71
Kentucky.....	130
Minnesota.....	144
New York.....	197
North Dakota.....	208-209
Ohio.....	126
Oregon.....	145
Tennessee.....	5
Utah.....	40
Vermont.....	59
Virginia.....	96
Silage crops	
Virginia.....	42, 96
See also Corn silage	
Silo filling	
Mississippi.....	100
New Hampshire.....	212
Wisconsin.....	111
Sirup	
See Maple sirup; Sorghum sirup.	
Smith, H. P.....	162
Sorghum cane for factory	
Arkansas.....	109
Sorghum for sirup	
Mississippi.....	103
Sorghum hay	
Georgia.....	43, 203
Sorghum molasses	
Arkansas.....	109
Sorghum sirup	
South Carolina.....	75
Sorghums, grain.....	113
Kansas.....	7
Texas.....	7
Wisconsin.....	113
Sorghums, sowed	
Kansas.....	52
South Carolina. Agricultural	
experiment station.....	73-75, 155-156
South Carolina. State college of	
agriculture.....	105
South Dakota. Agricultural	
experiment station.....	11-12
South Dakota. Dept. of agricul-	
ture.....	8, 163
South Dakota. State college of	
agriculture and mechanic arts.....	10

	Item
Soybean hay	
Georgia.....	43, 203
Illinois.....	67-71, 149
Indiana.....	213
North Carolina.....	46-47, 158
Soybeans.....	87
Illinois.....	68-69, 71
Indiana.....	213
Kentucky.....	130
Louisiana.....	85
Missouri.....	121
North Carolina.....	46-47
Tennessee.....	5
Soybeans for seed	
Arkansas.....	109
Spelt	
South Dakota.....	10, 12
Spencer, Leland.....	164
Spillman, W. J.....	165-166
Spilman, R. F.....	162
Squash	
Washington.....	76
Steanson, Oscar.....	167-169
Steers.....	165
South Dakota.....	12
Virginia.....	96
Stock, work	
Mississippi.....	99, 101-104
North Carolina.....	158
Virginia.....	96
Strawberries	
Arkansas.....	16, 109
Florida.....	178
Kentucky.....	65
Missouri.....	176
Utah.....	185
Washington.....	77, 161
String beans.	
See Beans, string.	
Stumps	
See Brush and stumps	
Sudan grass for hay	
Kansas.....	52
Sugar	
See Maple sugar	
Sugar beets.....	87, 123-124, 184
California.....	14, 184
Colorado.....	14, 125, 141, 184
Idaho.....	14, 64, 184

Item	Item
Sugar beets - Continued	
Michigan.....14,184	Texas. Agricultural and
Montana.....184	mechanical college.....22,37,86,105
Nebraska.....184	Texas. Agricultural experiment
North Dakota.....94	station.....154,162
Ohio.....14,127,184	Thompson, W. C.....193
Utah.....14,184	Thomsen, F. L.....176
Washington.....76	Thorfinsson, T. S.....209
Wyoming.....184	Thorne, G. B.....176
Sugar cane	Timothy.....142
Georgia.....63,151	Arkansas.....109
Louisiana.....14	Illinois.....67-71,149
Mississippi.....101	Virginia.....42
Summers, T. H.....124	Timothy seed
Sweet potatoes	South Dakota.....1,11
Arkansas.....109	Tobacco.....21,87,123
Georgia.....63,151	Connecticut.....31
Louisiana.....85	Florida.....178
Mississippi.....101,102	Georgia.....50,63
New Jersey.....194	Kentucky.....50,66,129-130,181
North Carolina.....46	New York.....197
South Carolina.....75	North Carolina.....46-47
Swine.....87,123,165	Virginia.....18-19,187
Illinois.....29,168	Tolley, H. R.....177
Indiana.....169	Tomatoes.....123
Iowa.....167-168	Arkansas.....28,109
Kansas.....52	Connecticut.....207
Kentucky.....130	Florida.....178
Minnesota.....144	New Jersey.....28
Mississippi.....102	New Mexico.....55
New York.....197	New York.....28,197
North Carolina.....158	Ohio.....28
Ohio.....126	South Carolina.....75,155
South Carolina.....75	Texas.....55
South Dakota.....12	Washington.....161
Tennessee.....5	Truck crops.....87
Vermont.....59	Vermont.....59
Virginia.....96	See also names of kinds of
Swinson, C. R.....105,170-171,192	crops.
Taber, R. F.....172	Turlington, J. E.....178
Tabor, Paul.....43	Turnips
Tapp, J. W.....144,173-174	South Carolina.....75
Tennessee. Agricultural experiment	See also Rutabagas.
station.....5	
Tennessee. State board for	
vocational education.....5	
Tennessee. University. Dept. of	
agricultural education.....5	
Teske, A. H.....175	U. S. Dept. of agriculture..7,10,13-14,
	19-25,32,33,35,41-42,48-52,58,
	64-65,76,86-93,97-98,105,109,
	113,117,124,136-137,141-142,144,
	151-154,162,164,168-171,173-174,
	177,179,180-182,192,198-201,205-
	206,210.

Item	Item
U. S. Tariff commission.....183-184	Western Washington. Agricultural experiment station.....106
Utah. Agricultural experiment station.....40,140,185	Wheat.....6,21,87,123
	Arkansas.....109
Velvet beans	Colorado.....125
Georgia.....63	Georgia.....63,151
Vermont. Agricultural experiment station.....58a-59,61,214	Idaho.....32,64
Vermont. University and state college of agriculture.	Illinois.....67-71,148-149
Extension service.....186	Indiana.....135
Vernon, J. J.....42,187-188	Iowa.....72
Vetch hay	Kansas.....52,81-82,98,154,174,179,198
North Carolina.....46	Kentucky.....66,130,181
Vineyards	Minnesota.....98,143
California.....3	Missouri.....121,198
See also Grapes	Montana.....86,154
Virginia Agricultural college and polytechnic institute.....19	Nebraska.....86,98,154
Virginia. Agricultural experiment station.....18,42,96,187-188	Nevada.....198
	New York.....197
Wahlberg, H. E.....189	North Carolina.....158
Walker, A. L.....190	North Dakota.....94,98,208-209
Wallace, Henry O.....179	Ohio.....45,127,172
Waller, A. G.....191-196	Oklahoma.....86,98,154,198
Warren, G. F.....197	Oregon.....200-201
Washburn, R. S.....23,54,198-202	Pennsylvania.....80
Washington. Agricultural experiment station.....77,160-161,166	South Carolina.....74-75,155-156
Washington. State college of agriculture.....32	South Dakota.....8,10-12,98,163
Watermelons	Tennessee.....5
Arkansas.....109	Texas.....86,154
Florida.....178	Virginia.....18,96
Georgia.....63,151	Washington.....32,76
Pennsylvania.....114	West Virginia.....36
Weaver, Earl.....115	Wilcox, R. H.....168,205-206
Weaver, F. B.....202	Wilkinson, A. E.....207
Weiss, H. B.....194-196	Willard, R. E.....208-209
West Virginia. Agricultural experiment station.....36	Wilson, M. L.....210
Westbrook, E. C.....63,203-204	Wisconsin. Agricultural experiment station.....110-112
	Withycombe, Robert.....145
	Woodworth, H. C.....211-212
	Worsham, C. G.....8
	Young, E. C.....213
	Young, G. E.....169
	Young, H. P.....186,214

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